Guidelines for Assessing the Impact of Wind Farms on Birds and Bats

Version 4.0

GOBIERNO DE ESPAÑA
MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE
Fundación Biodiversidad

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Guidelines for Assessing the Impact of Wind Farms on Birds and Bats

(version 4.0)

Juan Carlos Atienza
Isabel Martín Fierro
Octavio Infante
Julieta Valls
Jon Domínguez

With the participation of:
Gonzalo Gil, Nuria Hortigüela, Ana Iñigo,
Ester Carlomagno, Cristian Pérez Granados and José Manuel Arcos

This version differs slightly from the version 3.0, having incorporated some data updates in the foreword, introduction and corrections of the erratum.

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Cover photograph: © Juan Bécares
Back-cover photograph: SEO/BirdLife
Photos: © Authors
Texts: © SEO/BirdLife
Translator: Dave Langlois
Layout: Simétrica
Printing: Netaigraf

 Recommended citation: Atienza, J. C., I. Martín Fierro, O. Infante, J. Valls and J. Domínguez. 2011. Directrices para la evaluación del impacto de los parques eólicos en aves y murciélagos (versión 3.0). SEO/BirdLife, Madrid (translated into English as Guidelines for Assessing the Impact of Wind Farms on Birds and Bats (Version 4.0).

In any case a check should always to be made to find the most updated version at www.seo.org

Legal Deposit: M-23490-2014
Publication date: September 2014

Printed on recycled paper

Comments on this guide: Any comment on this guide is welcome for the purpose of improving later versions. These comments should be sent to conservacion@seo.org

Published by:
SEO/BirdLife
C/ Melquiades Biencinto, 34
28053 Madrid
Telephone: 91 434 09 10
www.seo.org

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FOREWORD

Wind-power takeup has been swift in Spain, with 1072 wind farms and 12,080 wind turbines installed in the country by the end of 2013. Industrial projects of this type have a huge potential impact on birds. SEO/BirdLife has therefore been keeping a close watch on them for some time. It has investigated their impact in the field, has participated actively in the environmental impact assessment procedure (checking more than 500 design projects) and has examined dozens of wind-farm monitoring plans. The conclusion drawn from all this hard work was that wind farms are not being properly assessed. As a result many farms with a high environmental impact are being authorised. Especially enlightening here was SEO/BirdLife's analysis of over 100 wind farm projects presented in Extremadura in December 2006.

With the aim of helping to improve the assessment of projects of this type, thus pre-empting the death of many birds, this guide draws on all the experience built up while checking through all these projects.

This guide has been written and designed with the idea of being periodically updated on an ongoing basis. For this reason the version formula was chosen, similar to the system used for digital files. Hard-paper copies will be published only of editions representing significant advances on previous versions; otherwise digital editions only will be published in PDF format on SEO/BirdLife's website. http://www.seo.org

This format will allow new information to be phased in as soon as it is published in reference works or expressed in specialist meetings and congresses; the various annexes can also be updated as new information comes to light.

Bearing in mind this chosen format and the possibility of continual updates, we would be grateful for any comment or collaboration that might improve future versions.

The translation of this guidance from Spanish into English was undertaken thanks to the generous support of the MAVA Foundation.

Photo: Jordi Prieto- SEO/BirdLife

Wind turbine and power line.

INTRODUCTION

The current wind-power situation in Europe

According to figures from the European Wind Energy Association (EWEA), Europe's total installed wind-power capacity at the end of 2013 was 117.3 GW. The country with the biggest installed capacity is Germany followed by Spain, the UK and Italy (Figure 1).

Annual installations of wind power have increased over the last 13 years, from 3.2 GW in 2000 to 11.2 GW in 2013, a compound annual growth rate of 10% (Figure 2). Some countries, however, like Spain, Italy and France, saw a significant dip in their wind-farm installation rate in 2013, with reductions of 81%, 65% and 24% respectively (Figure 3).

Of the 11,159 MW installed in 2013, 9592 MW corresponded to onshore wind power and the remaining 1567 MW to offshore wind power. While onshore development has fallen, offshore wind power has increased by 34%.

In 2013 72% of the European Union's new power capacity came from renewables. The new renewable power generating capacity of 25,450 MW broke down as follows: 44% from wind power, 43% from solar PV and the rest came from biomass, hydro, concentrated solar power (CSP), waste, geothermal and the ocean, in order of decreasing importance.

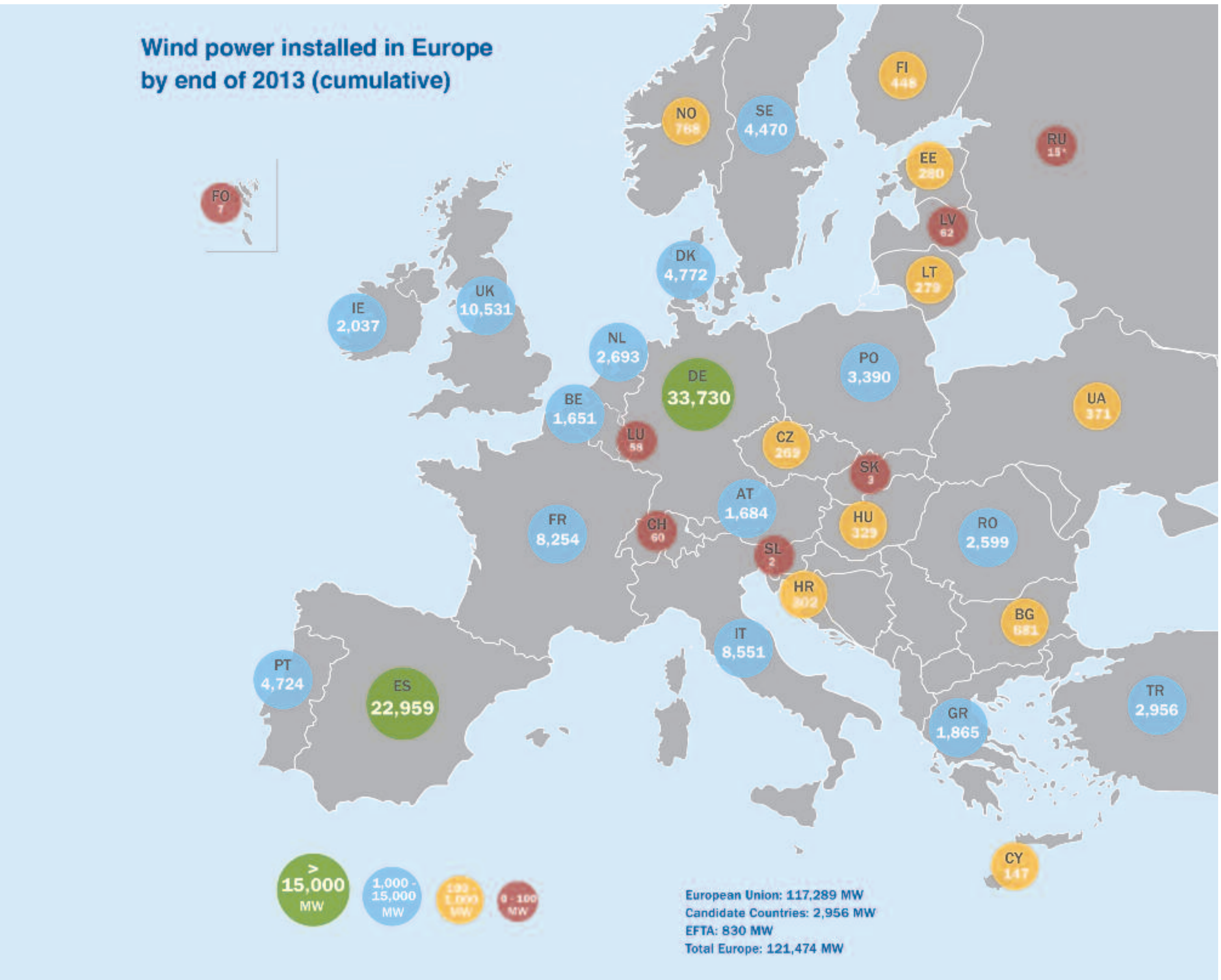


Figure 1. *Wind Power (MW) installed in Europe by the end of 2013*

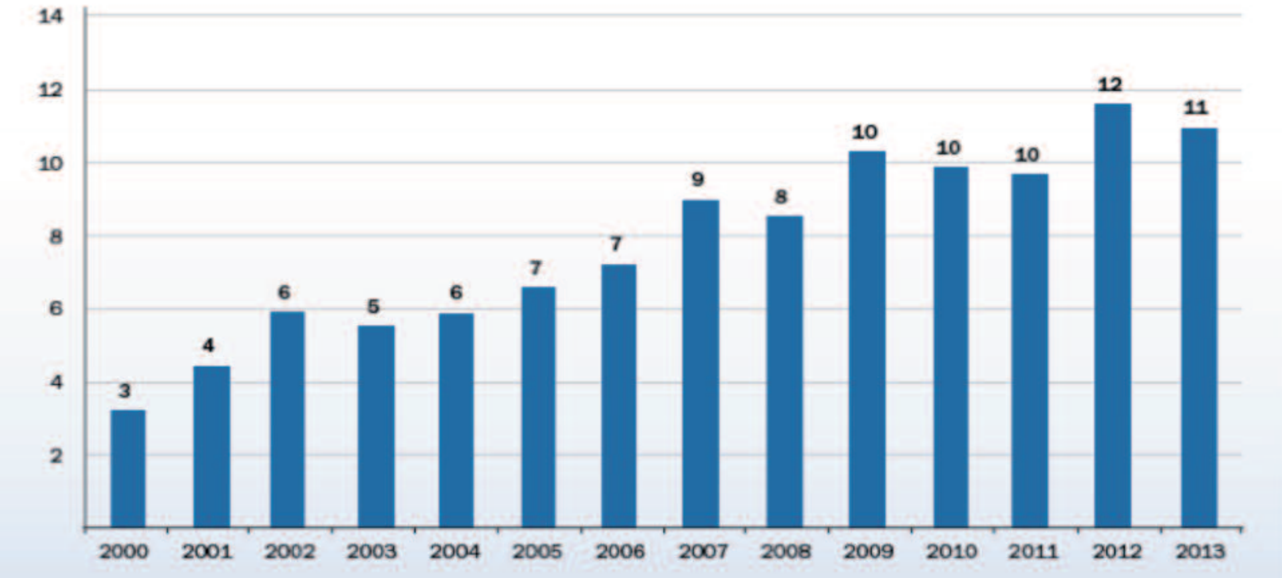


Figure 2. *Annual installed wind-power trend (MW) in the EU*

	Installed 2012	End 2012	Installed 2013	End 2013
EU Capacity (MW)				
Austria	296	1,377	308	1,684
Belgium	297	1,375	276	1,651
Bulgaria	158	674	7.1	681
Croatia	48	180	122	302
Cyprus	13	147	0	147
Czech Republic	44	260	9	269
Denmark	220	4,162	657	4,772
Estonia	86	269	11	280
Finland	89	288	162	448
France	814	7,623	631	8,254
Germany	2,297	30,989	3,238	33,730
Greece	117	1,749	116	1,865
Hungary*	0	329	0	329
Ireland	121	1,749	288	2,037
Italy	1,239	8,118	444	8,551
Latvia	12	60	2	62
Lithuania	60	263	16	279
Luxembourg	14	58	0	58
Malta	0	0	0	0
Netherlands	119	2,391	303	2,693
Poland	880	2,496	894	3,390
Portugal	155	4,529	196	4,724
Romania	923	1,905	695	2,599
Slovakia	0	3	0	3
Slovenia	0	0	2	2
Spain	1,110	22,784	175	22,959
Sweden	846	3,582	724	4,470
United Kingdom	2,064	8,649	1,883	10,531
Total EU-28	**12,102**	**106,454**	**11,159**	**117,289**
Total EU-15	**9,879**	**99,868**	**9,402**	**108,946**
Total EU-13	**2,224**	**6,586**	**1,757**	**8,343**

Figure 3. *Installed wind-power capacity (MW) per EU country in 2012/2013*

The wind energy capacity currently installed in the EU would thus produce in an average wind year 257 TWh of electricity, enough to cover 8% of the EU's total electricity consumption.

Impacts of wind power

Wind power is being used as one of the ways of combatting global warming; as such its worth is unimpeachable. Nonetheless, wind power is not without its downside,

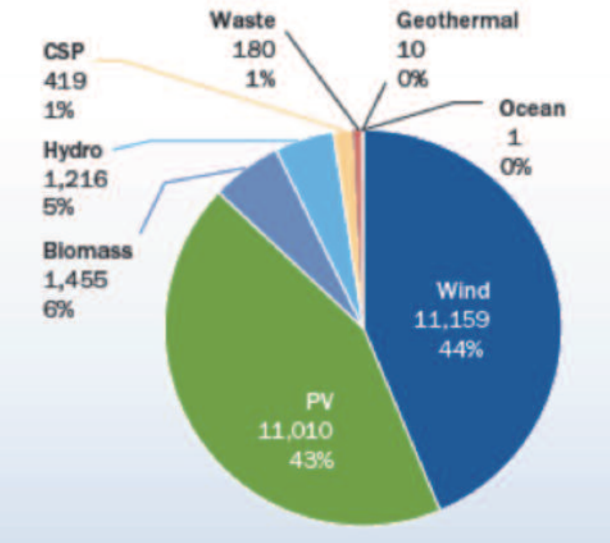


Figure 4. *Share of new renewable power capacity installations (MW) in 2013 in EU countries. (Source EWEA, 2013)*

both for natural conservation and the public at large. For example, the absence in Spain of any environmental assessment of wind power plans and programmes means that the rapid takeup of wind power has often gone ahead without any proper planning and monitoring and hence with a worsening of its intrinsic negative effects.

These impacts occur in all process phases, running from plant and power-line construction right through to operation and dismantling phases; some of these impacts are:

1. **Impacts on wildlife:** Studies to date have shown that the most heavily affected wildlife groups are birds and bats, albeit with the caveat that no detailed study has yet been made of the impacts on other animal groups. The main impacts can be summed up as:

   - *Collisions:* Collisions occur when birds or bats fail to manoeuvre their way round the wind-turbine blades or power lines leading off to the grid. This is a direct cause of death. Injuries are also caused by rotor turbulence. This is one of the most obvious and measurable effects and is therefore one of the main concerns when weighing up wind farm risks.
   - *Disturbance and enforced desertion:* The wind turbines themselves, the noise and vibrations they produce and the electromagnetic fields they set up, as well as the toing and froing of people and vehicles during construction work, all represent disturbance to wildlife and may force certain species to desert the zone altogether. This poses a problem when the alternative areas they are forced to move to are not big enough or are too far away, possibly reducing the species' breeding success and survival rate. During the operating phase, moreover, the new tracks and paths opened up make it easier for people and vehicles to use zones that were hitherto inaccessible. It has been estimated that an average of 10 km of paths and tracks are opened up for each new wind farm in Spain, thus increasing local permeability.
   - *Barrier effect:* Wind farms balk birds' movements, whether on their migration routes or their routine movements between foraging and resting areas. This barrier effect could have dire consequences for the breeding success and survival rate of the species in question. To skirt wind farms birds need to spend more energy and this might weaken them in the end.
   - *Habitat loss:* The land occupied by the wind farms suffers a significant reduction in its natural and systemic values. In a worst-case scenario it is no longer available at all to the birds that previously used it.

2. **Land Occupation and Degradation:** The setting up of a new wind farm involves civil-engineering work like excavations and earth movements, not only on the final wind-turbine site itself but also in adjacent zones where sundry infrastructure has to be built like substations, grid-access power lines, access tracks for machinery movements, etc. The lie of the land may be permanently affected by any land-levelling and embankment work, sometimes increasing the runoff and erosion risk. Scrub is also usually cleared and bushes grubbed up, reducing vegetation cover.

3. **Scenic impact:** This is one of the aspects of most concern to the public at large. Wind turbines, after all, are not usually set up in degraded or industrial areas or close to built-up zones but rather in mountainous or hilly countryside areas, often on the summits to harness the wind better. The resulting visual impact causes great consternation.

4. **Noise:** Both mechanical and aerodynamic noise is given off by wind-turbine components. Given the rapid growth in the number of wind farms planned in the future, exerting an increasing pressure on protected sites and biodiversity, it is therefore crucial to make sure now that this development is carried out in such a way as to minimise negative environmental impacts.

The Environmental Assessment of Plans and Programmes (EAPP) and the Environmental Impact Assessment (EIA) are the two most efficient tools for bringing environmental factors into planning and decision-taking procedures, thus minimising the negative environmental consequences. There are currently no guidelines in Spain for assessing the environmental impact of wind farms, whether onshore, offshore or coastal.

The lack of any proper Environmental Assessment of Plans and Programmes or any suitable assessment of projects has led to a chaotic implementation of this energy source, with very grave environmental impacts. Wind-power development in Extremadura is later analysed and described as a particular example of this general situation. For many years this region, which is famous for its biological diversity, stood out against the development of wind power.

Size of the wind-farm impact on birds and bats

Although there are by now many wind farms up and running throughout the world and over 850 wind farms and 17,000 wind turbines currently set up in Spain, the published information on their impact on bats and birds is based on a small number of these farms. The information to hand suggests that direct mortality from wind-turbine collision is lower than the collision rate with other human-made infrastructure (Crockford, 1992; Coulson *et al*., 1995; Gill *et al*., 1996; Erickson *et al*., 2001; Kerlinger, 2001; Percival, 2001; Langston and Pullan, 2002; Kingsley and Whittam, 2007). There also seems to be a great variability in the mortality detected from one farm to another. It is nonetheless difficult to come up with any precise idea of the real impact, for the following reasons: 1) only a small percentage of wind turbines has ever been monitored; 2) in general the impact is estimated on the basis only of detected deaths rather than the impact on populations; 3) No adjustment factors are used to allow for searcher-efficiency and scavenger-removal skews ; 4) there is very little transparency in the impact monitoring studies carried out by the public or private sector, and 5) on many occasions the methodology employed is inadequate. It should be borne in mind here that companies are not particularly keen for it to become publically known that their infrastructure kills protected species of birds and bats, some of them in danger of extinction and covered by expensive recovery plans. Moreover, environmental watchdog groups often value higher the positive effect on global warming than the negative effect on biodiversity.

Neither should we lose sight of the fact that even small fatality rates might have a critical effect for threatened species or those with a very low rate of breeding success (Langston and Pullan, 2003).

Another factor to be taken into account here is that there is very little information on wind-farm passerine mortality. Very few studies have been carried out and these small birds are much less likely to be found during ground searches and more likely to be completely removed by scavengers. The removal rate of small birds might be as high as 10% in the first 8 hours (Winkelman, 1989) and ≤ 50% in the first 24 hours (Winkelman, 1992a). Most will have disappeared in 1–3 days (Kerlinger *et al*., 2000) and 70–80% in the first two days (Lekuona and Ursúa, 2007).

From the available information the following provisional conclusions can be drawn:

1) The fatality rate per wind turbine and year varies from 0 to 9.33 birds in the United States (Cheskey & Zedan, 2010). In Spain it varies from 1.2 in Oíz (Vizkaya; Unamuno *et al*., 2005) to 64.26 in the wind farm El Perdón (Navarra; Lekuona, 2001).
2) Some studies suggest that wind-farm bird fatality varies directly with bird density (Langston and Pullan, 2003; Everaert, 2003; Smallwood and Thelander, 2004; Barrios and Rodríguez, 2004; Desholm, 2009). This finding, however, is not borne out by other studies (Fernley *et al*., 2006; Whitfield and Madders, 2006; de Lucas *et al*., 2008), perhaps because not only the density is important but also the use of space in the vicinity of the farm (de Lucas *et al*., 2008; Smallwood *et al*., 2009). Quite possibly a study combining these two factors would give us a much better idea of the collision risk. Lekuona and Ursúa (2007) found that the relative abundance of a species is not a good indicator of the relative frequency of wind turbine collisions; only in some species (griffon vulture and kestrel) does this relation obtain.
3) Wind-turbine siting has a big effect on collision probability. Farms sited in or near areas used by a large number of birds for feeding, breeding, resting or migration are clearly going to be more dangerous (e.g., Scott *et al*., 1972; Faanes, 1987; Henderson *et al*., 1996; Exo *et al*., 2003; Everaert and Stienen, 2006).
4) Certain landscape features, mainly the relief, could increase the farm fatality rate. Farms sited on crests, in valleys or on steep slopes, near gorges and on peninsulas and straits are likely to kill more birds (Orloff and Flannery, 1992; Anderson *et al*., 2000; Kingsley and Whittam, 2007).
5) Poor weather conditions, especially misty or cloudy days, increase bird mortality (Kingsley and Whittam, 2007); much the same goes for other types of human-made infrastructure (Case *et al*., 1965; Seets and Bohlen, 1977; Elkins, 1988).
6) Wind farms might cause severe disturbance to birds, especially seabirds and open grassland birds (Kingsley and Whittam, 2007).
7) Mortality and other negative wind farm effects could depend on the amount of suitable habitat present in the zone. The less suitable habitat there is, the likelier birds are to stay closer to the wind turbines (Landscape Design Associates, 2000).
8) Wind turbines situated near the end of a line pose a greater collision risk, since many birds veer away from the centre of the line-up (Orloff and Flannery, 1992; Dirksen *et al*., 1998).
9) Tubular wind-turbine towers kill fewer birds than lattice towers; no mortality differences have been shown by other technological advances, however (Orloff and Flannery, 1992; Anderson *et al*., 2000).

10) Although studies tend in general to concentrate on wind-turbine effects on large raptors, it has been shown that 78% of the birds killed in the United States were protected passerines (Erickson *et al*., 2001). Probably the same goes for Europe and the effect has not been recorded due to the fatality monitoring methods used.

11) Wintering birds seem to have higher mortality rates than residents (Kingsley and Whittam, 2007); migratory birds are especially affected (Johnson *et al*., 2002). The likelihood of migratory bird wind-turbine collisions will depend on many variables, especially the species involved, the lie of the land, the weather on the day, the time they pass through the wind farm (migration height varies at different times of day), the amount of habitat available for rest, the density of migration through the zone, etc. (Kerlinger, 1995; Richardson, 2000; Robbins, 2002; Langston and Pullan, 2002; Mabey, 2004).

12) Although some studies have found no clear relationship between the fatality rate and size of the wind turbines (Howell, 1995), structure size does seem have a clear effect on collision probability, especially in conditions of poor visibility (Winkelman, 1992a; Ogden, 1996; Hötker *et al*., 2006). There is clear evidence, for example, that the danger posed to nocturnal migrants by television towers increases with tower height (e.g., Crawford and Engstrom, 2001). Many authors have therefore warned that increasing the height of the wind turbines, taking them into the flight paths of night migrants, could increase the fatality rate (Kingsley and Whittam, 2007).

13) There is no evidence to show that birds get used to skirting the wind turbines over time, reducing the collision risk. Long-term studies show no difference in fatality rates over the years (de Lucas *et al*., 2008).

14) Even small wind-farm fatality rates might pose a considerable extinction threat for long-living species (Carrete *et al*., 2009).

15) Bird behaviour around wind turbines is a crucial factor for analysing the likeliness of collision. Food searching behaviour or interactions with other birds considerably increase the collision risk (Smallwood *et al*., 2009).

16) At high wind speeds (>1.5 m/s) fewer birds fly. Nonetheless it is precisely at these wind speeds, just when they have the least avoidance capacity, that most birds fly at less than 50 m from the rotors. The collision risk is therefore greater at high wind speeds (Smallwood *et al*., 2009).

17) Aeronautical warning lights fitted at the top of the wind turbines attract birds, therefore posing a threat to night migrants. Drewitt and Langston (2008) studied this situation and drew the following conclusions:

    a) It is by now widely accepted and known that birds are attracted and confused by lights, especially on misty or cloudy nights (Laskey, 1954; Cochran and Graber, 1958; Weir, 1976; Elkins, 1983; Verheijen, 1985; Gauthreaux and Belser 2006).

    b) Birds attracted by the lights run the risk not only of direct death or injury from collisions but also of exhaustion, running low on food reserves and being picked off by predators (Ogden, 1996; Hüppop *et al*., 2006).

    c) Although there have as yet been no thoroughgoing studies of lighting methods with less bird-attraction potential, the replacement of constant red or white lights by flashing lights does sometimes reduce the attraction effect and *ipso facto* night-migrant mortality (Baldwin, 1965; Taylor, 1981; Ogden, 1996; Kerlinger, 2000a; Gauthreaux and Belser, 2006).

    d) Replacement of white lights by red lights, however, throws up conflicting results (see Avery *et al*., 1976; Kerlinger, 2000a). Some studies suggest that any light source visible to human beings is also visible to birds and hence poses a potential risk (Verheijen, 1985).

    e) It is probable that light intensity and frequency are more important factors than colour itself; the longer is the off-period between each flash, the lower is the attraction or confusion effect (Manville, 2000; Hüppop *et al*., 2006).

There is even less information to go on for bats, which have tended to attract less attention from scientists and government authorities. Working methods with this animal group are also much more complex. The following general comments can nonetheless be made:

1) Death has been confirmed of at least twenty bat species; Eurobat considers 21 species to be prone to wind turbine collisions (Rodrigues *et al*., 2008).

2) Most bat deaths occur in early summer and autumn (Alcalde, 2003; Johnson *et al*., 2003) and they tend to be migratory species (Ahlén, 1997 and 2002; Johnson *et al*., 2003; Petersons, 1990) although sedentary species are also affected (Arnett, 2005; Brinkmann *et al*., 2006).

3) Wind farm studies using suitable methods for detecting bat collision show fatality rates of between 6.3 and 99 bats per wind turbine and year. These findings would suggest an even bigger impact on bats than on birds.

All the abovementioned figures need to be taken with some caution, however, since detected deaths seem to be only the tip of the iceberg. The following factors might all contribute towards an underestimation of the real threat:

1) Few monitoring studies have been published. In general there is a great lack of transparency among private firms and public authorities. A higher number of studies could completely change the picture.
2) Some wind-farm workers have been known to hide carcasses perhaps thinking that their jobs might be endangered if a high bird mortality rate came to light. This means that the fatality rate shown in monitoring plans would be lower than the real one.
3) It is known that not all wind turbines of the same wind farm pose the same collision risk. Most studies, however, analyse the mortality only of a small percentage of the wind turbines.
4) The methodology employed may not be suitable for finding small birds and bats.
5) Most published studies fail to take into account the combined regional effect of neighbouring wind farms.

How many birds do wind farms kill?

As yet no official estimates of wind-farm bird fatality have been published. We therefore need to turn elsewhere for our information, and this section tries to come up with some sort of answer. According to the wind-power sector itself, the wind-farm bat- and bird-fatality-rate is low; this conclusion is drawn from wind-farm monitoring reports based on dead-bird counts. It is vital to bear in mind, however, that certain skews in these figures have to be corrected by means of adjustment factors to arrive at any realistic estimate. The most important skews are scavenger removal and observer efficiency. Neither do these monitoring plans make any allowance for the fact that searchers do not take in the whole area in which carcasses are likely to be found. Depending on the size of the victim and the type of effect, many injured birds may continue flying to succumb and die outside the search area. Lastly, deaths caused by the power line leading from the wind farm to the grid also have to be factored in, since these power lines are an essential wind-farm component.

Any realistic estimate of wind-farm bird fatality therefore has to take into account the following factors: 1) the minimum mortality based on carcasses found in the wind farms; 2) the percentage of carcasses removed by predators and scavengers in between ground searches (usually carried out fortnightly in Spain); 3) searcher efficiency, or the percentage of existing carcasses actually found by searchers and 4) the area actually covered by the searchers as a percentage of the whole area in which victims might fall.

Any calculation of wind-farm bird fatality is very sensitive to even small variations in the adjustment factors. The scavenger removal rate will depend on the size and type of the carcass and the amount of predators/scavengers in the area, possibly fluctuating at different times of the year. Few of the fatality monitoring studies use trial carcasses of different sizes; many of them use dead chickens from farms, which are easier to detect for a scavenger than wild birds. Almost no study carries out the trials at different times of year to weigh up the effect of the fluctuating number of scavengers.

Searcher efficiency trials also tend to make the same mistakes in terms of the size and type of dummy carcasses and the failure to carry out trials at different times of year. Depending on the type of habitat in the proposed wind-farm site, this last factor may be crucial. In many cases, moreover, the trial searchers are aware beforehand of the number of dummy carcasses used or can guess the distance between each one, skewing the results.

A realistic estimate of wind-farm bird fatality in Spain should therefore be based on monitoring plans with a shorter frequency than fortnightly. Fatality, searcher efficiency and scavenger removal rates should all be based on trials using carcasses of different sizes carried out in the wind-farm implementation zone.

Given the absence of any official figures at present, we can gain a working idea of the size of this threat by studying the figures from SEO/BirdLife's check of 136 Spanish wind-farm monitoring plans. The mortality and adjustment factors used correspond to averaged figures from wind-farm monitoring procedures in four different regions (Aragón, Castilla y León, Castilla-La Mancha and Andalucía). Thus, on the basis of a mean fatality of 2 birds a year for each wind-turbine, a scavenger removal rate of 95%, a searcher-efficiency rate of 13.3% and an installed capacity of 17,780 wind turbines, the total bird kill comes out as over 8,000,000, to which must be added the power-line bird kill. These power lines leading from the wind turbines to grid access points are on average 9 km long for each wind farm. Assuming a minimum detected fatality rate of 1.07 birds per km, the total bird kill for the 880 wind farms existing in 2010 would come out as over one million.

As already pointed out, these figures vary considerably according to even small changes in the skew-correction factors. But in any case, even using the lowest mortality estimate figures, direct bird kills still add up to over one million a year. These figures show that the wind-farm bird-fatality rate is considerable, highlighting the need for improved and standardised monitoring methods to ensure that fatality estimates are realistic.

The following examples give an idea of how much the real problem may be greater than the detected one:

- **Golden eagle**
  A study of 60-70 nesting pairs of golden eagles (*Aquila chrysaetos*) around a large wind resource area showed a death rate of 30-40 eagles a year, with wind turbines responsible for 42% of total deaths (Hunt, 2002).

  Smallwood *et al*. (2009) suggest that golden eagles face the biggest collision risk when they are foraging for food on the wind farm site and interacting with other eagles around the wind turbines.

- **Egyptian vulture**
  Carrete *et al*. (2009) investigated the effect of wind farms on the viability of the Egyptian vulture (*Neophron percnopterus*) population. The study concentrated on generating models for assessing wind-farm impact on the survival of the Egyptian vulture, taking the species as a good example of especially long-living species that are prone to wind-turbine collisions. The study found that wind farms had been constructed in the vicinity of nearly one third of the specie's breeding territories. The models obtained from this study predict a fall in population sizes and, *ipso facto*, an increase in the probability of the extinction of the Egyptian vulture when all wind-farm mortality is factored into the equation. These results show the need of examining the long-term impact of wind farms instead of concentrating on short-term mortality. The conclusion is clear: unlike other non-natural mortality factors that are difficult to control or eradicate, the wind-farm-driven increase in mortality can be reduced by means of sound planning and assessment beforehand to rule out wind farms in zones critical for birds in danger of extinction.

- **Vultures**
  Griffon and cinereous vultures (*Gyps fulvus* and *Aegypius monachus*) are birds that are particularly hard-hit by wind farms due to two behavioural idiosyncrasies: firstly, they tend to range over huge areas and, secondly, they are largely wind-dependent in their movements (using the same resource, therefore as wind turbines themselves). Vultures also have a high wing loading, making them clumsy fliers in the absence of suitable air currents and thermals (Tucker, 1971); this increases their wind-turbine-blade collision risk (Pennycuick, 1975; Janss, 2000; de Lucas *et al*., 2008). A higher fatality rate has in fact been observed in tall wind turbines located on high ground than in shorter wind turbines on lower ground (de Lucas *et al*., 2008). Higher griffon-vulture mortality has also been recorded in winter when there are fewer thermals to ride (de Lucas *et al*., 2008).

By September 2007 fifty percent of the 10x10 km grids with nesting griffon vultures were already within 30 km of a working wind farm and 15% within 10 km (table 1 and figure 5) (Tellería, 2009b). This shows poor wind power planning in Spain.

Working from the rather meagre information furnished by regional authorities, SEO/BirdLife has now compiled information on the 645 griffon vulture deaths in Spain (Annex I). The vulture fatality rate is particularly high in some wind farms. Lekuona (2001) estimated nearly 8 vulture deaths per wind turbine and year in the Salajones Wind farm in Navarre; Lekuona and Ursúa (2007) consider the griffon vulture to be the species most often killed in wind farms in Navarre, accounting for 63.1% of total bird deaths.

Although the griffon-vulture population has been growing during the last 20 years, this positive trend might well be reversed in the long term by this new factor of non-natural mortality in combination with the reduction in food sources due to the new legislation brought in after the outbreak of mad-cow disease. Wind-farm fatality effects on populations of especially long-lived species also have to be factored into the picture (Carrete *et al*., 2009).

POTENTIALLY AFFECTED AREA

	Spain	<5 km	<10 km	20 km	<30 km
UTM grids	751	42 (5.59%)	108 (14.38%)	249 (33.16%)	381 (50.73%)
No. of wind turbines	13044	1855 (14.22%)	3938 (30.19%)	5504 (42.20%)	6804 (52.16%)
Capacity (MW)	10886	1606 (14.75%)	3371 (30.93%)	4804 (44.13%)	5880 (54.01%)

Table 1. *Number and percentage of 10 x 10 km grids with breeding griffon vultures included in a potentially affected area at a distance of 5, 10, 20 and 30 km from wind farms (Source: Tellería, 2009)*

- **Dupont's Lark**

  A 2005 study carried out by researchers of the Higher Scientific Research Council (*Consejo Superior de Investigaciones Científicas*: CSIC) showed that 8% of the populations of Dupont's lark (*Chersophilus duponti*) studied now coincided with wind farms and in 36% of populations anemometers had been installed, revealing an interest in setting up new farms (Laiolo and Tella, 2006).

  Another study carried out in 2007 by researchers of the *Universidad Autónoma de Madrid* for the Environment Ministry (*Ministerio de Medio Ambiente*) showed that 11% of the subpopulations of Dupont's lark had wind farms inside their territory (Suárez and Garza, 2007).

  Furthermore, according to the European Commission's international Dupont's lark action plan[1], wind farms are now one of the main threats to this species, listed as Critical.

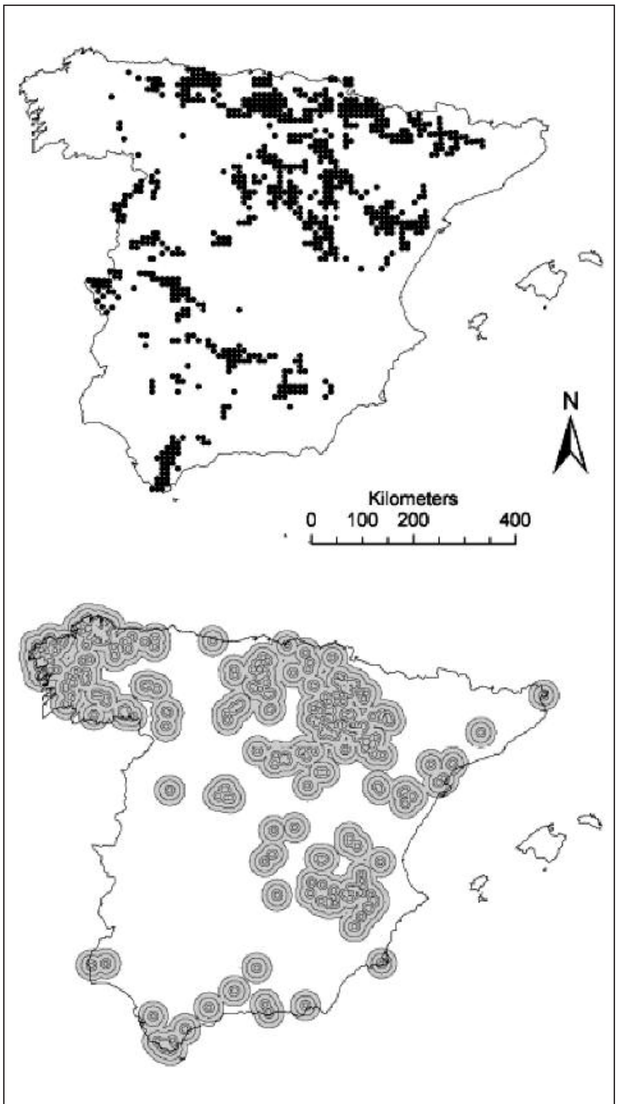


Figure 5. *Top: distribution of griffon vulture. Bottom: distribution of possibly affected areas 5, 10, 20 and 30 km around the wind farms installed in Spain. (Source: Tellería, 2009b)*

- **The Province of Soria**

  According to a report by the *Delegación Provincial de Soria* wind-farm deaths up to July 2009 totalled 1209 birds belonging to 88 different species and 45 bats of 5 different species. These deaths included booted eagle (*Hieraaetus pennatus*), short-toed eagle (*Circaetus gallicus*), golden eagle (*Aquila chrysaetos*), Dupont's lark (*Chersophilus duponti*), griffon vulture (*Gyps fulvus*), cinereous vulture (*Aegypius monachus*), lesser kestrel (*Falco naumanni*), peregrine falcon (*Falco peregrinus*), red kite (*Milvus milvus*) and ring ouzel (*Turdus torquatus*) (J.M. Barrio de Miguel, *in litt*).

  It should be borne in mind, however, that these figures understate the impact of wind farms, for the two following reasons: 1) these figures have not been taken from the reports of the surveillance plan information but from studies carried out by the wind farm developers following a protocol enforced by the *Delegación Provincial*; 2) The figures show carcasses found without any adjustment to correct searcher-efficiency or scavenger-removal skews.

  An analysis of 23 half-yearly monitoring reports from 15 wind farms in Soria, conducted basically from 2005 to 2006, shows a total of 143 dead griffon vultures. In some wind farms, like Las Aldehuelas, a total of 29 vulture carcasses were found; 28 in Urano and 32 in Bordecorex Norte (Biovent energía, S.A., 2006a, 2006b; Endusa 2006; Portulano 2006a, 2006b, 2007; Biovent energía, S.A. 2007). In Soria there are 732 up-and-running wind turbines and the griffon vulture fatality rate in the analysed farms is 0.31 vultures per wind turbine per year, so the annual fatality rate could add up to c. 226 vultures. There is hence an urgent need to assess all the wind farms of the province of Soria, with studies taking in all the wind turbines. Furthermore, other studies of several farms set up in the same region, for example in Navarre (Lekuona, 2001), have found very high fatality rates.

1. http://ec.europa.eu/environment/nature/conservation/wildbirds/action_plans/docs/chersophilus_duponti.pdf

Although the griffon vulture's population has been growing in Soria over the last decade, a watershed moment can be identified in the IBA Tiermes-Caracena in 2005. From 1999 to 2005 the population increased from 238 to 474 pairs (a 100% increase); by 2008, however, only 332 pairs were breeding: a 30% fall (Hernández *et al*., 2005). This fall coincided with two factors: firstly, the coming into force of the new livestock carcass collection rules, cutting down the food sources for these birds, and secondly the coming on line of several wind farms in Retortillo de Soria and Montejo de Tiermes in the province of Soria itself and in Ayllón and Grado del Pico in neighbouring Segovia.

Moreover, although the number of colonies in the province of Soria has grown steadily since 1989, eight colonies detected in previous counts have now disappeared, most of them small and some of them lying alongside new wind farms where a high fatality rate has been detected (Fabio Flechoso, pers, com. in Hernández, J. L. 2009).

To all this must be added the impact on the population of Dupont's lark in Soria, as mentioned in the previous section.

It would therefore seem that the cumulative impact of all the wind farms could be very high, impinging directly on bird populations.

The quality of environmental impact assessment reports

One of the big problems posed by environmental impact assessment, both at national and European level, is the lack of any control over the quality of environmental impact assessment reports (European Commission, DG ENV, 2009). At European level some member states have also stressed the problems they face in terms of ensuring the quality of the input data for environmental impact assessment reports (EIA report).

The low quality of these environmental impact reports could lead to a mistaken decision to grant development consent, since the final decision has been based on wrong information.

With the aim of ascertaining the quality of environmental impact assessments in Spain, SEO/BirdLife carried out a detailed analysis of 116 EIA Reports submitted in Extremadura.

On 12 December 2006 the *Diario Oficial de Extremadura* (government journal publishing all new regional legislation) publically announced 116 applications for government authorisation of new wind farms (1952 wind turbines and 3670 MW capacity). This represented the end of this region's moratorium on this type of energy production.

Poorly assessed projects

Hardly any of the submitted environmental impact studies abided by the terms and conditions laid down by other comparable countries for assessing the wildlife impact of wind farms, despite the fact that Extremadura's wildlife riches are much greater than in these other countries and its responsibility for conservation of the environment correspondingly much higher.

One of the aspects analysed was the wildlife inventory. It stands to reason that a *sine qua non* for any properly conducted assessment under "Directive 97/11/EEC on the assessment of the effects of certain public and private projects on the environment" is a sound knowledge beforehand of the animals that live in the area. In general it can be safely said that none of the studies worked from a sufficient inventory to meet the objective laid down by the abovementioned directory. To start with, only 29% of the studies took in all animal groups while the others restricted themselves to giving information on birds or mammals. In general, too, none of the studies identified species involved in migratory movements in winter. This is due to two main reasons; firstly, because most studies are based solely on bibliographical sources and there is no published atlas on wintering birds or birds and bats on passage; secondly, because the period laid down by the government for drawing up and assessing projects was January to June 2006 so there was no possibility of carrying out any fieldwork. This is a particularly grave fault; the few studies that exist on the impact of wind turbines show that it is in the winter and during migration when they take their heaviest toll on birds and bats (Kingsley and Wittham, 2007; Johnson *et al*., 2002, 2003; Ahlén, 1997 and 2002; Petersons, 1990). To this must be added the fact that only 25% of the study inventories involved any fieldwork; even within this 25% no reference was made to the number of days, dates and number of hours spent or the fieldwork methodology employed so it is very difficult to assess their worth. Equally striking is the fact that, barring honourable exceptions, the studies lacked any input from the authority responsible for nature conservation, even when concerning work with bats or the pinpointing of especially sensitive birds like raptors and other soaring birds.

None of the projects, therefore, was based on a detailed knowledge of the species present at all times of year, much less the number of individuals involved and their space-using habits.

Only 47% of the projects indicated the degree of protection of the species identified in the wildlife inventory (Catalogues of Threatened Species), and only 29% their risk of extinction (the "*Libros Rojos*" or Red Data Book). There are even several projects that are still using old versions of the *Libro Rojo*.

No study, moreover, has presented a true analysis of alternative sitings, not even when the Natura 2000 network could be affected. In general the studies restricted themselves to defining the chosen site, on the grounds that the Extremadura government had already proposed exclusion zones; in the best of cases alternatives were put forward for individual wind turbines or alternative technologies. No project defined with grounds the area affected by the project and *ipso facto* the area over which the impacts are to be assessed. Most simply defined the affected area as the actual wind farm site, without taking into account that these wind farms could affect species nesting a considerable distance away (e.g., griffon vultures, which might forage for food scores of kilometres from their nesting colonies).

None of the projects assessed the cumulative impact together with other proposed wind farms or other wildlife-impacting projects in the area. Much of the blame for this must be put down to the procedure chosen by the *Junta de Extremadura* (regional government), obliging all projects with their EIA reports to be presented at the same time.

Finally, in an attempt to ascertain whether the bird-impact of the proposed wind farms had been properly assessed, the following information was noted down:

Firstly if all the species catalogued as Vulnerable or higher in the *Catálogo Regional de Especies Amenazadas* (Regional Catalogue of Threatened Species) or the *Libro Rojo* or those listed in Annex I of the Birds Directive had been duly taken into account, as the species calling for special conservation measures, and, if so, whether the assessment was correct. To check if all the species had been taken into account, a comparison was made with the list obtained from the breeding-bird atlas grids in which the projected wind farm was to be sited. To ascertain whether the assessment was correctly carried out, it was assumed that the assessor worked from the following information: distribution, abundance, use of territory and airspace in the proposed wind farm site.

The results obtained were the following (shown graphically in Table 2): No environmental impact study took into account all nesting species or the proper assessment factors. Abundance was the factor most taken into account; 7.4% did so for all key species and 11.8% for some species. No study factored in the use made of the territory by the species present and much less their use of airspace in the wind turbine zone. This stands out in sharp contrast to the practice in other countries where radars are used to analyse airspace use by the birds frequenting the site. Eighty percent of the projects failed to take these factors into account for any species at all.

Part of the responsibility for this patchy and piecemeal approach and the poor quality of the EIA Reports in general can probably be put down to the fact that there is no reference framework in Extremadura for assessing projects of this type.

Improvement of the studies of wind-farm fatality risk

Another problem detected in the environmental impact assessment reports is the failure to factor in wind-farm fatality risk properly or even at all. Ferrer *et al*. (2011) suggest that the most commonly used method in EIA reports, namely, the estimation of potential fatality by observing and recording birds present in the proposed wind farm site, has a very low predictive power and as such is untenable.

These authors propose the following EIA improvements:

- Species fatality estimates should be more reliable, using specific approaches in each case.

Assessment factors	Some species	No species	All species
Distribution	8.8	89.7	1.5
Abundance	11.8	80.9	7.3
Use of territory	1.5	98.5	0.0
Habitat selection	5.9	86.8	7.3
Use of airspace	2.9	97.1	0.0
5 former factors	0.0	100.0	0.0

Table 2. *Percentage of environmental impact studies that took into account a series of key factors when assessing the impact on bats and birds*

– Previous studies lasting at least one year should be carried out. Bird behaviour and use of airspace is affected by the **wind direction**. Previous studies have been shown not to assess this variable properly, resulting in an underestimation of the fatality rate.

– Estimates of airspace-use based on fixed-point observations are potentially skewed due to the long observation distances, leading to an underestimate of the use of certain areas. This error is particularly crucial for small and medium-sized birds. Line **transects or radar systems** should be used to obtain more reliable figures.

– One of the greatest weaknesses in wind-farm fatality risk studies is the assumption of a linear relation between observed bird frequency and collisions (Langston & Pullan, 2003). Certain wind-turbine locations may in fact turn out to be very dangerous to birds even when bird densities in the area are low. EIA reports should **assess the risk for each proposed wind turbine.**

Fragmentation of projects – Assessment of synergistic impacts

At the moment a large share of wind farms in Spain are being assessed in a fragmented way. Developers, with government backing, tend to break up projects for three basic reasons: 1) to become eligible for more premiums; 2) to bring the assessment process down from national to regional level; and 3) to play down the real impact of each wind farm and thus make authorisation more likely.

Aspects of economy and jurisdictional competence go beyond the remits of this manual. Even so, we do have to look at the effects of this fragmentation on the environmental impact assessment. It is quite common practice to divide up a single 50 MW wind farm artificially at project stage into several spurious wind farms by the simple expedient of connecting them up to different transformation positions in the same electricity substation. They are then dealt with as individual wind farms with different EIA reports. It stands to reason, however, that the sum of wind turbines and infrastructure associated with each wind farm making up the project, even if dealt with separately, has cumulative effects on the same elements of landscape and biodiversity. It is therefore essential for them all to be assessed jointly. Government project-fragmentation procedures make it impossible to undertake a single EIA report at source. There is therefore a need for each one of the studies to include a study of synergistic and cumulative impacts of the different farms. This holds true not only on the grounds of common sense but also according to current legislation[2]. The same combined approach is essential when several wind farms are planned in the same zone, even though promoted by different developers. Courts have repeatedly ruled to this effect concerning wind farms[3].

Any environmental impact study should therefore include a detailed chapter on the cumulative and synergistic impacts of all authorised or projected wind farms plus all their associated infrastructure (power lines leading off to the grid, access paths and roads, etc.). This entails asking the competent authority for a list of these projected wind farms and their basic facts and figures (siting of the wind turbines and substations, trajectories of the power lines and paths, etc.) and also trawling through the *boletines oficiales* (official journals of new legislation) to find out wind farms projected in the area. To decide on the territorial scope over which the combined effect is to be assessed, we can be guided by the criteria defined by the courts:

1) Physical proximity to other wind farms, for example lying within 10-15 km of the wind farm now being projected.

2) Joint effect on the same protected site. In other words, if the projected wind farm under assessment could have an effect on a protected site, either individually or in combination with other nearby wind farms, then they have to be assessed jointly. The territorial scope of the study is therefore defined by the protected site and its buffer zone; this might entail having to assess wind farms lying a long way from the projected wind farm under assessment now.

2. Articles 7, 8 and 10 of *Real Decreto* (Royal Decree) 1131/1988 of 30 September approving the execution regulation of *Real Decreto Legislativo* (Royal Legislative Decree) 1302/1986 of 28 June on environmental impact assessments (which develops article 2 of said *Real Decreto Legislativo* 1302/1986, subsequently, article 7 of *Real Decreto Legislativo* 1/2008, of 11 January), and article 5.3 of Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment and article 6.3 of the Habitats Directive 92/43/EEC (and its implementation into Spain's body of law under article 45 of the Natural Heritage and Biodiversity Act 42/2007 (*Ley de Patrimonio Natural y de la Biodiversidad*) of 14 December) in terms of the obligation of assessing the combined effects of projected wind farms to be set up in sites of the Natura 2000 network.

3. Judgement 1448/2009 of 10 June 2009 of the *Sala de lo Contencioso Administrativo* (Judicial Review Chamber) of the *Tribunal Superior de Justicia de Castilla y León* (High Court of Castilla y León); Judgements 333/2010 of 10 May 2010, and 373/2010 of 21 May 2010 of the *Sala de lo Contencioso Administrativo del Tribunal Superior de Justicia de Castilla y León*.-Burgos.

3) Joint effect on the same natural element. An example might be the same population of a threatened species. In such a case the territorial scope would be defined by the range of this population and the distribution of the up-and-running and projected farms that might affect it.

If several wind farms are projected in the same zone, it is usually more effective for all the developers to come to an agreement on a single synergistic impact study. This is what occurred, for example, with wind-power development in Tierras Altas de Medinaceli (Soria), although in this case the procedure was faulty since it was carried out after rather than before authorisation of the farms.

The first step, therefore, is to define the elements to be taken into account in the assessment (species, habitats or protected sites) and, working from there, the territorial scope accordingly. The study of the synergistic impact must be done with participation of specialists in the elements to be assessed.

Studies of the cumulative and synergistic impact have to include at least the following content:

1) Explanation of the choice of the natural elements to be taken into account in the assessment (species, habitats and protected sites).
2) Explanation of the choice of the territorial scope on the basis of the elements and projects to be assessed.
3) Description of the projects considered in the analysis, containing at least detailed mapping of the sites and their main features (capacity and height of the wind turbines, surface area of tracks and platforms, characteristics of the power line, etc.).
4) Determination and description of the natural elements taken into account. In the case of species and habitats, a detailed description has to be given of the biological characteristics that make them prone to harm from the projects under study. In the case of sites, a determination shall be made of the key species and habitats to be studied, with grounds given for the levels of impact deemed to be acceptable insofar as the projected farms would not alter the integrity of the site or its conservation objectives.
5) Description of the situation of the natural elements taken into account within the scope of analysis. For species the minimum description has to include their population, habitat selection, distribution and availability. For sites, their conservation objectives and management instruments, if any, and an analysis of the compatibility thereof with wind-power development. All these elements have to be mapped.
6) Description of the impacts of each one of the projects on each one of the elements. At least the following impacts have to be assessed:
   - Analysis of the abundance of the populations and relation with the area of habitat affected by the wind farms
   - Collision risk
   - Habitat disruption
   - Direct habitat loss
   - Indirect habitat loss
   - In the case of fragmented habitats, the effect on the viability of the broken-up pieces of habitat
   - Effect on territories
   - Predation risk induced by the increase of non-specialist predators
   - Effects on the environmental connectivity of the populations

   This description should in all cases be quantitative and based on the best scientific knowledge to hand. The information has to be displayed in such a way as to bring out all the individual and cumulative impacts.
7) Proposed corrective measures.
8) Predictive-model assessment of the effect of the various projected wind farms on the natural elements under study. The model has to take into account not only the cumulative impact but also any synergistic impacts that might occur. The result, in the case of species, will be an analysis of population viability to determine the population size that would result if all the projected wind farms actually came to be built.

   All projects will not necessarily have the same effect so an analysis should be made on the basis of different scenarios. The starting scenario would be up-and-running wind farms, then phasing in new scenarios with approved but not yet constructed wind farms and finally those that are still in the process of being authorised. This would lead to the identification of different scenarios with their corresponding cumulative and synergistic impact on the elements under study.

   The models have to take into account the situation both with and without application of proposed corrective measures. The aim here is to assess directly the residual impact of the group of projects.

This study would probably call for specific fieldwork and complex analyses, so it is crucial for this to be taken on board from the word go to avoid unnecessary delays later on.

Need for environmental impact study guidelines

Spain currently lacks any wind-power planning procedure capable of striking the right balance between energy targets and nature conservation. Furthermore, there is no quality assurance in environmental impact assessment of projected wind farms to ensure prevention of any important impacts on the environment.

Although the wind-power implementation process has differed from region to region, the sad truth is that there is not much difference in the quality of the studies carried out. Witness the results of bird mortality obtained in Navarre (Lekuona, 2001) or in Soria.

Given the clear prospects of an upward trend in the development of the wind-power sector, there is now a pressing need for clear guidelines to ensure that the environmental impact assessment procedure meets its objectives. Prime among these objectives should be avoidance of the impact produced by these human developments.

For all these reasons this manual puts forward a methodology to be followed for identifying, assessing, monitoring and mitigating any adverse wind-farm effect on birds and bats.

Photo: Jordi Prieto- SEO/BirdLife

STRATEGIC ENVIRONMENTAL ASSESSMENT AND PLANNING

Sustainable development of wind power can be achieved only by means of strategic planning that ensures inclusion of all environmental values in the first decision-taking stages. This is where the strategic environmental assessment (SEA) comes into its own, as the prevention instrument designed to integrate environmental aspects into the decision-taking procedures of public programmes and plans that might have a significant impact on the environment. The idea of the strategic environmental assessment was brought into EC law by Directive 2001/42/EC, duly implemented in Spain's body of law by Law 9/2006 on assessment of the environmental effects of certain plans and programmes (*Ley sobre evaluación de los efectos de determinados planes and programas en el medio ambiente*).

Unfortunately, however, the implementation of wind power in Spain has been hasty and disorderly. The first wind farms were assessed at project level; some years later, however, under an avalanche of submitted design projects, some *comunidades autónomas* (Spanish regions) were forced to declare moratoriums and draw up their own wind-power plans, with the aim of planning the regional implementation of this power supply. Some regions like Andalusia and Castilla and León opted for provincial plans and others decided to go for a regional level. In general, none of these planning arrangements took due account of the impacts on biodiversity and protected sites; nor were they properly assessed in environmental terms.

In fact, since the coming into force of *Ley 9/2006* only two wind-power plans have been submitted to an assessment of this type. Castilla-La Mancha approved the Wind-Power Plan Horizon 2014 (*Plan Eólico horizonte 2014*) and the Environment Ministry (*Ministerio de Medio Ambiente*) approved the strategic assessment procedure for offshore wind farms. Both plans have resulted in a zoning scheme of areas compatible with and incompatible with wind-power development, respectively. These two planning arrangements have some criticisable aspects but at least they represent a great advance on earlier plans.

The failure to submit wind-power plans to a proper strategic environmental assessment procedure has often led to a design purely in terms of the distribution of the wind-power resource, leaving all environmental questions out of the picture completely. It should be remembered here that the strategic environmental assessment is preventive in character and its ultimate aim is to avoid or minimise impacts on the environment, seeking to strike the right balance between economic development and environmental conservation.

Furthermore, the failure to submit plans to a proper strategic environmental assessment procedure, far from speeding things up, could lead to long delays. Witness the case of Catalunya, where the Higher Court of Justice (*Tribunal Superior de Justicia*) dictated an injunction sus-

Offshore Wind Farms

A particular case of the development of wind power is to set up the plants at sea. Under the National Renewable Energy Action Plan 2010-2020 (*Plan de Acción Nacional de Energía Renovable 2010-2020*) offshore wind power is set to reach an output of c. 8000 GWh by 2020.

With this aim in mind, in 2008, the Spanish government produced the Strategic Environmental Assessment of the Spanish Coastline for setting up Offshore Wind Farms (*Estudio estratégico ambiental del litoral Español para la instalación de parques eólicos marinos*) drawn up jointly by the Ministry of the Environment and Rural and Marine Affairs (*Ministerio de Medio Ambiente y Medio Rural y Marino*) and the Ministry of Industry, Tourism and Trade (*Ministerio de Industria, Turismo y Comercio*), laying down a three-tier zoning system: exclusion zones; suitable zones on certain environmental conditions, and suitable zones without conditions.

In 2007, while said study was underway, SEO/BirdLife input preliminary results from the Life+ Project Marine Important Bird Areas (IBAs) in Spain (*Áreas Importantes para la Conservación de las Aves (IBA) Marinas en España*) for these findings to be taken into account, stressing that all these areas should be classified as exclusion zones. Given that the listing of Marine IBAs was not yet complete at that time, however, the study map guarantees exclusion of offshore wind farms in only part of the surface area covered by the inventory. Despite this, the number of marine IBAs considered to be suitable on certain environmental conditions is notably high, including areas of great sensitivity such as some of the zones identified as key for migration (especially off the northwestern coast of Spain/Portugal) and feeding zones as important as the Delta del Ebro–Columbretes continental shelf. Sometimes the zones proposed as suitable even coincide with marine IBAs.

It is necessary to ensure total exclusion of wind farms from the list of marine IBAs, especially as almost all of them are in the process of being declared SPAs. The marine SPA proposal published in October 2011 is accompanied with a document laying down basic management principles, which do not up to now ensure said exclusion. Over and above the IBA/SPA inventory, it is likewise necessary to review the sensitivity of certain areas, especially areas of heavy migration that have been left out of the inventory on the northwest coast of the Iberian Peninsula.

Although there is already a regional planning system in place within the framework of the Strategic Environmental Study of the Spanish Coastline (*Estudio Estratégico Ambiental del Litoral Español*), identifying exclusion zones, suitable zones and suitable zones on certain environmental conditions, a more in-depth study is now needed of the negative effects on biodiversity, doing so by means of environmental impact assessments (Desholm *et al*., 2005, 2006; Fox *et al*., 2006).

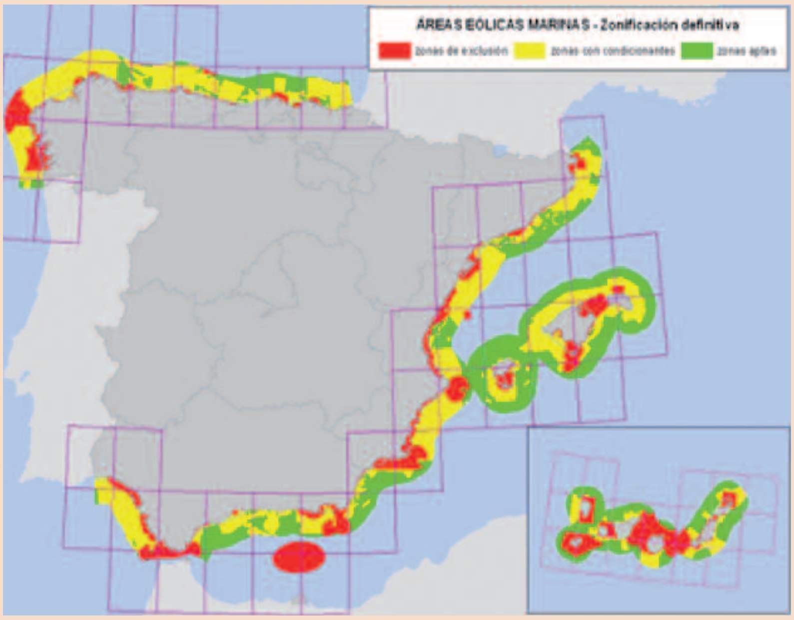


Figure 6. *Zoning of the strategic environmental study for the placement of offshore wind farms. Source: Ministerio de Medio Ambiente, Medio Rural y Marino and Ministerio de Industria, Comercio y Turismo*

pending the planning of priority wind power development zones on the grounds of a lack of environmental assessment. The selfsame thing occurred in Cantabria, where complaints have been presented in court against plan approval without a previous strategic environmental assessment, thereby flouting Directive 2001/42/EEC and the Aarhus Convention on public information and participation in governmental decision-taking.

It is widely recognised that suitable implementation of wind power relies on proper planning, to ensure that power generation plants are set up in areas with a low environmental impact (Langston and Pullan, 2003). Thoroughgoing, government-approved plans, however, are all too thin on the ground; as are reliable scientific studies of the matter.

The few analyses made of the global impact of up-and-running wind farms bring out the grave planning and assessment errors that have been made in Spain. Witness such examples as the global impact of wind farms to date on Egyptian vultures (Carrete *et al*., 2009) or on other vulture species (Tellería, 2009b) or on migration routes (Tellería, 2009a and Chart 1). Nonetheless, although in some countries like Spain there are already many wind turbines installed and ongoing plans to increase this power supply significantly in the future[4], there are no national or regional plans to back them up.

This chapter sets out the minimum elements required in any suitable regional (or national) wind power planning arrangements on the basis of past experience. Comments are also made about the proper assessment procedure, since, like any other plan in the European Union, it should be assessed under Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment.

Planning factors to be taken into account

Proper wind power planning needs to take into account all the following factors:

Essential elements for the production of wind power

1) Wind maps / Availability of viable wind resources.
2) Access to the power grid. In the case of Spain, to REE's Electricity Transformation Substations.

Elements that reduce the impact on protected sites and habitats

3) All protected sites must be considered and excluded (Protected Natural Areas [*Espacios Naturales Protegidos*: ENPs]), Natura 2000 sites and sites deriving from international conventions such as Ramsar wetlands).
4) All Important Bird Areas (IBAs of BirdLife International) must be considered and excluded.
5) All priority habitats under the Habitats Directive must be considered and excluded.
6) An analysis should be made of whether there is any singular habitat in the region that is worthy of preservation and hence exclution from wind power development even though not actually included in European legislation.
7) All habitats listed under the Spanish Catalogue of Habitats in Danger of Extinction (*Catálogo Español de Hábitats en Peligro de Desaparición*) must be excluded.

Elements that reduce the impact on sensitive or threatened species

8) All areas identified in Recovery and Conservation Plans (*Planes de Recuperación and Conservación*) of the most threatened species ("polygons") must be considered and excluded.
9) Breeding areas of the most sensitive and threatened bats and birds must be considered and excluded (radial system).
10) Grids with a high level of combined index of birdlife richness, singularity and conservation interest must be considered and excluded (grid system).
11) Resting or wintering areas of the most sensitive and threatened bats and birds must be considered and excluded (polygons).

4. Pursuant to Directive 2001/77/EC Of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond» [COM(2008) 768 final – not published in the Official Journal] and Communication from the Commission to the Council and the European Parliament on the share of renewable energy in the EU Commission Report in accordance with Article 3 of Directive 2001/77/EC, evaluation of the effect of legislative instruments and other Community policies on the development of the contribution of renewable energy sources in the EU and proposals for concrete actions [COM (2004) 366 final - not published in the Official Journal].

Elements reducing the scenic impact

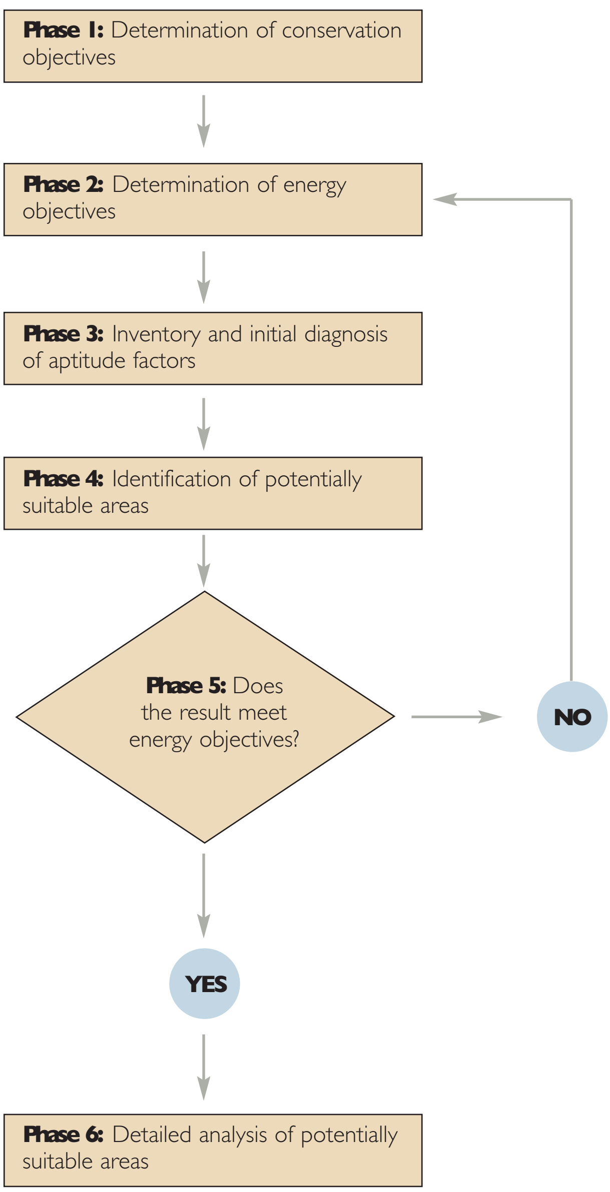
12) Visual impact maps should be drawn up.

Other elements to be taken into account

13) Urban planning.
14) Other regional planning procedures.
15) Zone accessibility.
16) Ground gradients.
17) Built-up areas.
18) Thoroughfares.
19) Noise maps should be drawn up.

Recommended planning procedure

Recommended planning procedure



Phase 1 - Determination of biodiversity conservation objectives

Conservation objectives should always override both energy and economic objectives or any other type of goal. The Spanish Biodiversity and Natural Heritage Law (*Ley de Patrimonio Natural y de la Biodiversidad*) itself cites the following as its main guiding ideas:

> *"incorporation of the precautionary principle into any interventions that might affect natural sites or wildlife; encouraging improved sustainability in development associated with protected nature sites; promotion of the orderly use of resources to guarantee sustainable exploitation of the natural heritage; and integration of the requirements of conservation, sustainable use, improvement and restoration of the natural heritage and biodiversity into sector-based policies".*

On occasion, however, the government itself has claimed that the public interest in wind farms overrides conservation of biodiversity, citing not only an economic interest but also setting the fight against climate change, supposedly favoured by wind farms, over conservation of biodiversity. This is merely a misinterpretation of the norms since the overriding public interest resides not so much in authorising these plants but rather ensuring they are carried through in due accordance with legal provisions, given that the principle of the efficacy of governmental procedure calls always for *"full subordination to the law"*, as laid down in article 103 of the Spanish Constitution. Along these lines the Spanish Supreme Court (*Tribunal Supremo*) has handed down several judgements on the prevalence of environmental protection over the public interest of a guaranteed power supply in assessing the impact of wind farms:

> *Judgement of the* Tribunal Supremo *Courtroom* 3, section 3 of 11 October 2011, rec. 6608/2010
>
> *"In the case of singular facilities, not so much of the transmission network – whose general incidence in the national electricity system is obvious – but rather power-generation plant, those considerations are not automatically and verbatim transferrable, but should be considered on a case-by-case basis, as is in fact obligatory in any injunction procedure. In the one we are dealing with here, it is question only of a wind farm whereby the temporary incidence of the injunction cannot, by its very nature, be other than limited and its repercussion on the general interests of the power supply system minimal. The set of considerations made by the court dealing with the case, with particular heed to those bringing out the shortfalls already stressed in the phases previous to the administrative authorisation, are viable grounds for the injunction".*

Judgement of the Tribunal Supremo Courtroom 3, section 3 of 8 July 2011, rec. 4222/2010

"Furthermore, neither are the arguments and pleas revolving around the periculum in mora *(exigent circumstance or inherent risk in procedural delay) principle in order here, since they are used to criticise the reasonable weighing up of the interests in conflict made by the court dealing with the case, claiming from a subjective perspective that the general interest of a guaranteed power supply should override any environmental protection concerns. This criticism of the judgements made in the challenged rulings is groundless, since the courtroom correctly and reasonably assesses the interests at stake, attributing to each counter argument its due specific value and reaching the cogent and consistent conclusion that the prevalent interest here is that the planned facilities should abide by legal provisions.*

The appeal submitted hereto plays down the importance of environmental protection in defence of a general public interest, i.e. the guaranteeing of a power supply, which it considers to be the overriding concern. Nonetheless, and even though in cases of a different ilk we have in fact considered this interest to be overriding (ATS [Ruling of the Supreme Court] of 21 October 2008, appeal 617/2007) we conclude here that the courtroom's assessment of this particular case is fair and reasonable, basing itself on the demonstration of grave procedural irregularities and concomitant harmful effects on the environment deriving from the setting up of the wind farm, substantially chiming in with case law on injunction legislation".

The objective of the planning procedure, therefore, should be to seek formulae for switching from polluting energy-generating and -use procedures to clean and renewable energy sources without impairment of the conservation of biodiversity, which is protected by various European Directives (especially the Birds Directive and the Habitats Directive) and by Spanish legislation itself.

Given that the object of the planning procedure is precisely the promotion of wind power and it is therefore clear that this interest will be sufficiently covered, it is necessary in the first phase to identify all environmental objects related to conservation of biodiversity, as deriving from the legal commitments of the regional planning authority. In particular, objectives need to be established on those environmental aspects that might be most affected by the setting up of wind farms and the power lines leading off to the national grid.

Phase 2 - Determination of Energy Objectives

In the interests of good planning it is essential to work from some energy objectives to be met by new wind farms. It is especially crucial to take the following aspects into account:

1) Wind power capacity to be installed and the timeframe for doing so.
2) Minimum and maximum size of the wind farms accepted by the project-authorising body. This will in turn determine the minimum size of the polygons to be identified in the planning process.
3) Wind-power technology to be applied (vertical or horizontal wind turbines) and maximum and minimum unit capacity per wind turbine.
4) Determination of the maximum and minimum exploitable wind-power resource (e.g. 4 m/s at a height of 80m).
5) Maximum output accepted by REE at each grid access point.
6) Planning of new REE-approved distribution lines and grid access points.

Phase 3 - Inventory and initial diagnosis of aptitude factors

This analysis should be carried out by means of a Geographical Information System, working from zones showing an exploitable wind-power resource and then whittling down the surface area considered as potentially suitable by successive elimination of zones affected by such exclusion criteria as are deemed to be fitting.

At the moment there are digital wind-power data layers in all regions of Spain. Of special importance are the layers generated by the National Renewable Energy Centre (*Centro Nacional de Energías Renovables*: CENER (consultable at www.globalwindmap.com). CENER's wind power resources map has been drawn up from 5 years of hourly simulations with the non-hydrostatic SKIRON meteorological model. The information is displayed publically, showing the windspeed at a height of 10 m for mainland Spain and the Balearic Islands with a resolution of 4.5 x 4.5 km, and for Navarre with a resolution of 1 x 1 km (figure 7, see page 26). Several *comunidades autónomas* and sector companies, however, have their own wind-power resource maps.

Exemption criteria should be closely bound up with the planning elements to be considered, as described beforehand herein.

In particular the following sites should be exempted **when they have been designated for conservation of wind-farm-sensitive species:**

1) Special Protection Areas.
2) Buffer zones around Special Protection Areas, which will vary in size according to the species for which the site has been declared. A minimum buffer zone of 10 km is recommended for scavenging birds, for example.
3) Protected Natura areas and Sites of Community Importance or Special Areas of Conservation.
4) Areas protected under international law:
   – Wetlands of International Importance, especially Waterbirds Habitat (RAMSAR Convention).
   – Natural World Heritage Sites of the Convention concerning the Protection of the World Cultural and Natural Heritage.
   – Protected sites of the Convention for the Protection of the marine Environment of the North-East Atlantic (the 'OSPAR Convention').
   – Specially Protected Areas of Mediterranean Importance (SPAMI), of the Convention for the protection of the marine environment and the Mediterranean coastline.
   – UNESCO's Biosphere Reserves.
   – The Biogenetic Reserves of the Council of Europe.
5) Important Bird Areas (IBAs of BirdLife International) with a similar buffer system to SPAs.
6) Sensitive areas defined by Conservation and Recovery Plans of threatened species.
7) Priority habitats under the Habitats Directive.
8) Habitats listed in the Spanish Catalogue of Habitats in Danger of Extinction[5].
9) Other habitats worthy of protection under regional planning arrangements.
10) Zones protected by regional ordinances (e.g. a Coastline Planning Ordinance, etc) or sector-based ordinances (e.g. an infrastructure plan).
11) Built-up areas.
12) Thoroughfares.
13) Protected elements of the historical-architectural heritage.
14) Protected elements of the geological heritage.
15) Sensitive zones for birds[6].
16) Sensitive areas for bats[7].
17) Sensitive areas for birds[8].
18) Important wetland environments for waterbirds and also flock-attracting landfill sites.
19) Mountain passes.
20) Important bird migration zones[9].
21) Easement and control areas around property of the public domain (inland watercourses, coastline, etc).

Special mention must go here to the conservation and recovery plans for threatened species, since wind-power plans never take into account the post-breeding and juvenile dispersal and feeding areas declared in the former plans.

To ensure the recovery of threatened species it is essential to pre-empt the appearance of new non-natural mortality factors (such as wind farms) in all habitats used by the species concerned for any of its vital functions (including sites used for feeding, nesting, post-breeding and juvenile dispersal, moulting, resting, migration stopover points and wintering areas).

The habitual practice in Spain is inclusion within the wind-power exclusion areas of the breeding areas of threatened species prone to collide with the wind turbines; feeding and dispersal areas tend to be rated in lower, less restrictive categories.

These shortfalls have been brought out in the wind-power plan of Castilla-La Mancha, where, once the plan had been approved, the Environmental Assessment Directorate then published an announcement in its official journal tagging on new provisions, such as the non-inclusion in wind-power exclusion zones of regional sites that were important as feeding or breeding areas or acted as biological corridors joining populations of bird species included in the Regional

5. At the date of writing, this edition of the manual this catalogue had not yet been created.

6. In Spain there is a combined index of conservation richness, singularity and interest, drawn up by SEO/BirdLife in 10×10 km grids using in weighted form all species present in the territory (Atienza *et al*., 2004). Bright *et al*. (2008) conservation propose a sensitivity map in 1×1 km grids based solely on species included in Annex I of the Birds Directive.

7. Due account should be given also to species' range in terms of breeding colonies and known resting and wintering areas.

8. Due account should be given also to species' range in terms of breeding colonies and known resting and wintering areas.

9. In Spain there are no bird migration maps but records of recoveries of ringed migratory birds can be tapped into (e.g., see Tellería, 2009a).

Catalogue of Threatened Species. This meant that such considerations would have to be phased into future revisions of the plan in the event of detecting possible grave impacts on the habitats of these species. To palliate this problem, the announcement also laid it down that impact assessments for projected wind farms in post-breeding dispersal areas of the large raptors should cater for an exclusion zone within a radius of at least 3 km around their nests and the compulsory provision of carrying out a study lasting at least one year beforehand with radio-tracking of birds within the zone to ascertain the species' behavioural patterns and post-breeding dispersal habits (Announcement of 06/03/2011, of the Environmental Assessment Directorate General on the environmental assessment procedure of the plan or programme called: *Plan Eólico de Castilla-La Mancha 2009-2012* [Wind-Power Plan of Castilla La Mancha 2009-2012]).

The setting up of wind farms and their associated infrastructure, such as overhead power lines leading off from the farm to grid-access points and access paths and roads, leads to habitat transformation or loss as well as mortality from collision with the blades of the wind turbines, with the tower or power lines. The presence of wind turbines or the presence of vehicles and people during the construction and maintenance of the farm could cause birds to desert the area and switch perforce to inferior habitat. The imposed need of searching out new territories could cut down their breeding success due to an increase in energy expenditure. Wind farms set up a barrier to bird mobility, breaking up the connection between feeding-, breeding- and dispersal-areas. The barrier effect might well cause various population changes and a knock-on effect of increased probability of extinction of a given population. The severity of this effect will vary inversely with the population size of the species concerned. The grouping of wind farms in the same space multiplies the barrier effect and also the number of collisions.

It should also be taken into account here that, despite the obligation of the *comunidades autónomas* to draw up and approve recovery and conservation plans of threatened species (Natural Heritage and Biodiversity Law 42/2007 [*Ley del Patrimonio Natural y de la Biodiversidad*]) there are still many species today that are not yet covered by any approved plans. The caution principle should therefore be applied to all those threatened species that are sensitive to wind farms but are not yet covered by their respective plans, exempting their breeding-, feeding-, dispersal-, migratory- and wintering-areas from zones deemed to be suitable for wind farms. Moreover, some regions have draft plans still being drawn up. These, albeit not yet definitive, should still be used in the wind-power planning procedure, on the grounds that it is at the moment the best information to hand for planning purposes.

Sensitivity maps should be drawn up to help identify those areas where there is the greatest likelihood of adverse effects on important bird populations. This analysis should include those species of birds that are highly prone to wind-farm mortality, either from the turbines themselves or their associated infrastructure. The sensitivity maps are based on the distribution of species with a high conservation priority and those that are especially sensitive to wind farms. The most up-to-date information should be used for this purpose.

Working from the mapped bird distribution, buffer zones are then designed, their size depending on the species concerned (hunting areas, vulnerability to disturbance, behavioural patterns, population ecology, etc) and the type of information available (breeding, wintering, roosting, etc.). Once all scientific documentation has been checked for determination of the buffer distances, experts should then ideally be consulted for each species.

Annex 2 shows proposed buffer distances for some species; these have been determined from estimated foraging areas in various field studies.

The buffer distances proposed herein can be used as a guide. Depending on the plan-application region, however, the best available information should be used, i.e., tallying best with the particular geographical situation in each case. These distances should also be updated as new research information comes on line. It should be borne in mind here that this approach has its built-in limitations, since bird's use of space is by no means uniform, depending on many factors such as the lie of the land, the habitat, food sources, etc. Many species, such as the golden eagle, do not even use all the territory regularly, distances therefore varying from one season to another (Haworth *et al*. 2006).

Species likely to be adversely affected by wind farms and for which there is not enough information to go on in terms of ascertaining their sensitive zones should be identified as "unknown sensitivity", with the aim of objectively assessing the resulting sensitivity map.

Sensitivity maps can help to guide stakeholders in the decision-making process, such as developers, local authorities, etc., but they can never stand in for specific studies carried out at design project level within the environmental impact assessment.

Phase 4 - Identification of zones potentially suitable for siting wind farms

After eliminating the areas that lack harnessable wind-power resources and also excluding areas on the 20 grounds spelt out above, we are left with a mosaic of polygons that might *prima facie* be suitable for siting wind farms.

This phase necessarily involves a detailed analysis of the polygons identified by process of elimination in the previous phase, to delimit them more precisely and obtain detailed information that cannot be obtained in the general analysis phase for the whole region.

First and foremost it is necessary to exclude those zones that are too small or are isolated or too far from possible grid connection points; all these factors would rule out the zone as a wind farm site.

With the remaining zones it is then necessary to flesh out the information initially obtained (for example, correcting database inaccuracies, allowing for ongoing changes in plant cover and land use, etc.), and also compile additional information, especially in relation to the archaeological heritage and other sensitive elements (raised bogs, mires and fens, singular vegetation, etc.) doing so in a detailed way by means of stereoscopic aerial photos followed up by on-the-spot visits.

At this level of analysis it is necessary to determine the visual impact of the farms and the possible of including unsightliness-mitigating measures.

The *Universidad de Cantabria* has proposed the following visual-impact assessment method (*Universidad de Cantabria*, 2008):

1) Ascertain the "maximum visibility area" of a wind turbine taking into account its height in the culminating point of the polygon in question. "Maximum visibility" is understood here to mean the total area over which the wind turbine will be visible (regardless of the observer's distance) and this is shown together with the national road network and built-up areas. Likewise, the visibility areas of each polygon are shown and also the total population and kilometres of roads of various types falling within each visibility area.
2) Determine the "magnitude of the visual effect" (*magnitud del efecto visual*: MEV), expressed as:

   $$MEV = AV \times P \times VC$$

   where:

   AV: *área de visibilidad* (visibility area) (km^2)

   P: the population falling within the AV (number of persons)

   VC: *vías de comunicación* (thoroughfares) within the AV (km)

   MEV: *magnitud del efecto visual* (km^3/persons)
3) Ascertain the "near visibility" area of each polygon, for a 16 km grid centred on the centroid of a hypothetical deployment of wind turbines throughout the culminating zone of the polygon. The reason for taking the abovementioned dimensions for the grid is that the visual intrusion effect of an artificial object on the scenery is reduced very significantly at distances of over 5 km.

The above procedure would then give us the total area, resident population, kilometres of highways of category I and II and the magnitude of the visual effect (expressed as km^3/personas) as criteria for excluding some polygons with a great scenic impact.

This phase should also exclude any areas in which the setting up of a wind farm would give access to countryside areas without access hitherto, with a concomitant negative impact.

All the above analyses should enable us to ringfence zones where wind turbines would be acceptable, without being able, at this level of detail, to assess other significant environmental impacts on the elements under consideration. This planning procedure, of course, does not obviate the need for subsequent assessment at design-project level, although it most certainly boosts the chances of these sites not presenting serious conflicts with the surrounding countryside.

Phase 5 - Assessment of the fulfilment of energy targets

Once this point has been reached, it is then necessary to assess whether, after identifying all suitable wind-farm areas at plan level, there then remains sufficient area for meeting the energy targets.

Normally there would be sufficient area for setting up a wind farm. If so, a priority should then be established for "suitable" zones with the aim of permitting the proposal of projects in those zones with less environmental impact. Non-excluding information from the previous analyses can be used for this purpose (e.g., the MEV).

If there is not enough area, thought should then be given to changing energy targets. There would not necessarily be a need for lowering installed capacity; perhaps instead it would be necessary to change the technical eligibility conditions to enable a greater wind-farm installation area. Lower wind turbines, for example, would have less of a visual impact and therefore allow wind-farms to be set up in more areas.

Phase 6 - Detailed analysis of the potentially suitable zones

Once an analysis has been made of the compatibility of the planning procedure with the various elements involved, it will then be necessary to make a detailed analysis of each one of the potentially suitable zones with the aim of including conditions for the presentation of projects in each zone in light of the idiosyncrasies of each case.

A maximum number of wind turbines could thus be authorised in each zone, or a maximum wind turbine height, specific formulae for the grid-access power line (buried power lines, etc.), specific construction arrangements, etc. Guidelines might even be given of some elements that will call for detailed analysis in the environmental impact assessment procedure of each project.

The Example of Cantabria

After a long wind-power moratorium, the government of Cantabria considered drawing up a plan that, within a few years, would build up to a total installed power of 1000–1200 MW per year, doing so by means of 2-3 MW wind turbines, i.e., c. 20-25 farms with 20 wind turbines each.

In line with the Cantabria region's ongoing policy of environmental excellence, the government contracted the *Universidad de Cantabria* to draw up a technical document that would guarantee an environment-friendly development of wind power in the region, cutting down environmental impacts to the bone (Universidad de Cantabria-Genercan, 2008).

To do so the *Universidad de Cantabria* followed basically the phases presented herein; the input of ornithological information came from SEO/BirdLife.

After the various phases had been carried out, an identification was then made of three potentially suitable wind-farm zones catering for c. 500 to 750 wind turbines (figure 8). The result threw up an area that could cope with the installation of double the initial target of wind turbines, though it must be pointed out that some of these sites might be ruled out after detailed assessment at design-project level.

The planning procedures met the main objectives described herein. The government of Cantabria, however, decided not to submit it to all the formalities of the environmental assessment of plans and programmes, earning it criticism from conservationist watchdog groups.

Figure 7. *Wind Map drawn up by CENER (www.globalwindmap.com)*

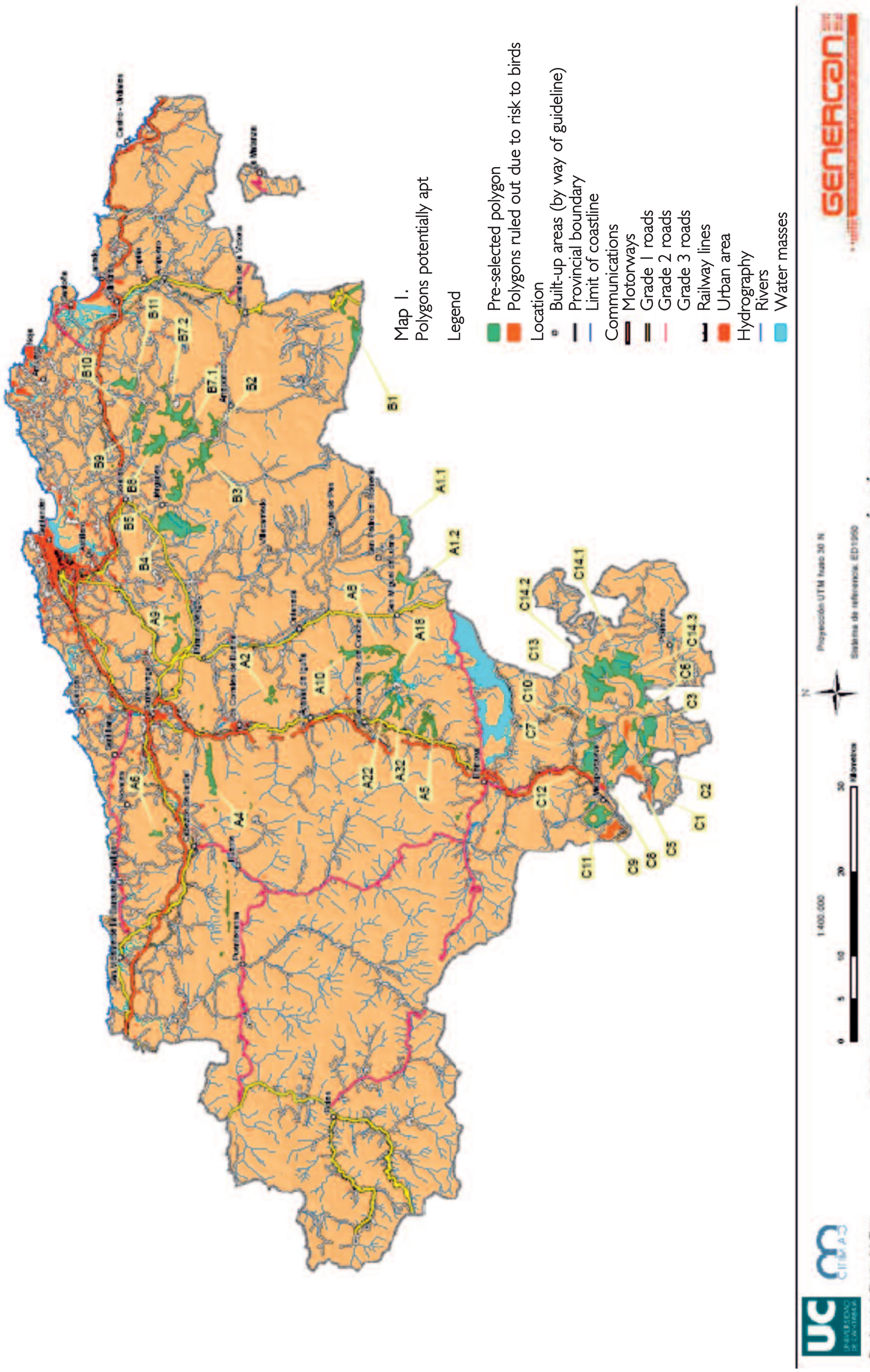


Figure 8. *Environmental strategy for harnessing wind power in Cantabria (Source: Universidad de Cantabria-Genercan, 2008)*

Environmental assessment of the plan

If all the phases indicated in this chapter are followed when drawing up a wind-power plan this practically ensures compliance with most of the assessment objectives laid down by Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment. Nonetheless, there are other objectives that have not been taken into account and need to be implemented. These include all the public information requisites of the plan.

One of the main objectives of Law 9/2006 on assessment of the environmental effects of certain plans and programmes is the encouragement of transparency and citizen participation, guaranteeing access in adequate timeframes to thoroughgoing and trustworthy information on the planning process.

The law is quite clear on this point: plans have to be assessed, brought to public notice and thereafter approved and published.

Chart 1 – Potential impact of wind farms on migration routes through the Pyrenees

A research project carried out by Tellería (2009b) looked at the potential impact of wind farms installed in Spain up to 2007 on the massive flow of birds through the western Pyrenean migration route. To identify the main entrance routes of wood pigeons (*Columba palumbus*) he drew on the figures for ringed birds recovered in the Pyrenees. The main flow of pigeons (50% of recoveries) was concentrated in a 50 km swathe. Although few wind farms were set up in this central band, many were set up in an adjacent sector accounting for 30% of recoveries. These results suggest that wind-power planning did not take into account the main migration entrance routes into the Iberian Peninsula.

Photo: Jordi Prieto-SEO/BirdLife

ASSESSMENT OF INDIVIDUAL WIND-FARM PROJECTS

The main objective of this chapter is to put forward a thoroughgoing wind-farm project environmental assessment method that minimises the impact on birds and bats.

To do so, an exhaustive review was first made of all scientific articles and monitoring studies on wind farms in different countries. The main aims of this research were to ascertain which species were most prone to collide with wind turbines or associated infrastructure and to compare mortality counts of birds and bats, bringing higher fatality rates into relation with certain causal factors such as farm siting, weather conditions, etc. The manual also took due account of the various biases introduced into the compiled information of the EIA reports, whether due to leaving out more costly information or the lack of published information (migratory birds, bat refuges, etc.).

Another source of information was the assessment reports and recommendations drawn up under cooperation agreements with the European Community, such as those carried out by BirdLife International on commission from the Council of Europe (Langston and Pullan, 2003) or those written by the European expert group Eurobats (Rodrigues *et al*., 2008).

A study was also made of similar initiatives successfully pursued in other countries, such as the wind-farm assessment guide proposed by the Canadian Wildlife Service (Environment Canada-Canadian Wildlife Service, 2006a), the manual produced by the French Environment and Sustainable Development Ministry (*Ministère de l'Ecologie et du Développement Durable*, 2004), the USA guide presented by the National Wind Co-ordinating Committee (Anderson *et al*., 1999), the bat-monitoring guidelines in Portugal (ICNB, 2009), the monitoring plan guidelines of LPO/BirdLife (André, 2004).

Objective of EIA reports: Questions that should be addressed and answered by a wind-power project EIA

The previous step to proposing any wind-farm impact assessment methodology is to identify clearly the information to be obtained. The objective of EIA reports is clear: cull the necessary information for the environmental authority to be able to pronounce on project viability exclusively from the environmental point of view. To draw up the questions, the first step is to identify the main impacts produced by wind farms. These might be summed up as follows: noise, scenic impact, occupation and degradation of terrain, impacts on bats and birds (collisions, disturbance, displacement, barrier effect, habitat loss).

The main questions to be answered by EIA reports, in relation to bats and birds, are the following:

- Does the wind farm involve a significant impact for threatened or priority species?
- Is there likely to be a high mortality of bats or birds? Which species would be involved? About how many deaths?
- Is there a heavy use of the site by bats or birds? Which species? What is their state of conservation?
- On the assumption that the project proves to be viable and acceptable from an environmental point of view, are there some locations that would pose a higher risk to bats or birds? Through which areas would the birds pass? At what height?
- Would the construction of the wind farm involve opening up an area that has hitherto been of difficult access for human beings? Would this entail heavier use of the zone by human beings? Are there species that might be unduly disturbed by this greater use of the wind farm and its hinterland?
- Is there any habitat of community interest in the wind turbine installation site or a threatened or listed plant species? Might they be affected by the setting up of the wind turbines or the opening up of access roads or other associated infrastructure?
- Are all the project viability factors being taken into account in this assessment?
- Does project viability call for any other power lines or substations not initially considered in the design project?
- Are there any wind-farm enlargement plans within the next 10 years or the possibility that the developer itself enlarge the original project within this timeframe?
- Are there any species particularly prone to power line collisions? What are their states of conservation and protection?
- Are there in the zone any other infrastructure or projects that might attract birds and increase the collision risk (scavenger feeding stations, landfill sites, etc.)?
- Are there in the zone any other infrastructure, constructed or in the pipeline, that might produce an impact on the same species or habitats?

- Are there other wind farms or wind-farm projects in the zone that might produce an impact on the same species or habitats? What would their combined impact be?
- Are there any other projects by the same or another firm within a 5 km radius?

Definition of a wind-farm project

A wind farm is the set of necessary plant for generating electricity from wind power, by means of a set of various wind turbines, electrically interconnected by an inhouse network, sharing the same access and control structure with own energy metering resources and grid connected through one or several Electricity Transformation Substations (ETS) and a transmission power line (TPL).

The following factors should therefore be taken into account in any wind-power project environmental assessment:

1) Wind turbines
2) Interconnection network to the ETS
3) Electricity Transformation Substations
4) Access roads
5) Control post (if necessary)
6) Transmission power line to grid connection

The first five items are necessary for generating the electricity and the sixth for commercialisation thereof. Indeed, article 21.7 of the Electric Sector Law 54/1997 of 27 November (*Ley del sector eléctrico*) lays it down that the production activity has to include transformation of the electricity and, as the case may be, connection with the transmission or distribution network.

All these elements must therefore be assessed as a whole to avoid committing a fragmentation of projects running counter to European law.

Moreover, all wind turbines separated by a distance of less than 2000 metres have to be considered as a single project, as well as all the farms whose administrative authorising procedure is carried out at the same time within the same municipal district and pumping their energy into the same grid connection point.

Any application for a new wind turbine standing less than 2000 metres from an already authorised wind turbine has to be considered as a wind farm extension.

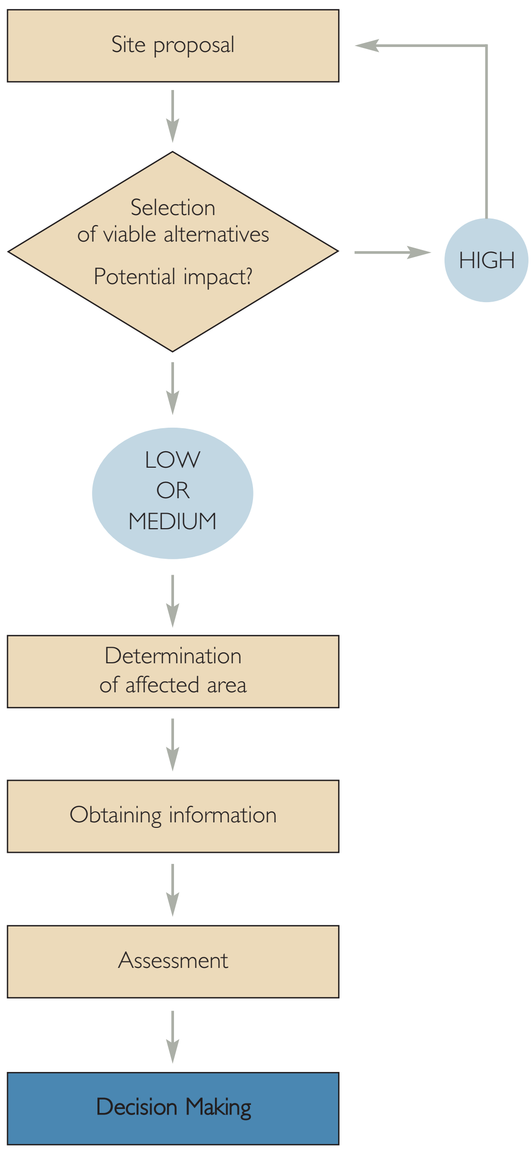
Assessment Structure

A very simple assessment scheme is proposed herein, based on the following:

1) a quick and simple previous assessment , of low-cost for the developer, to help in the choice of viable alternatives
2) an objective identification of the area affected
3) the obtaining of reasoned information to serve as the basis of the assessment, and
4) an objective assessment based on criteria applicable to all wind farms.

The various phases of the proposed procedure are broken down in the following diagram:

Chart 2. *Flow diagram of the process for obtaining suitable wind-farm impact assessment information*



Previous analysis of the proposed wind-farm site and selection of viable alternatives

Both Spanish and European law call for different alternatives to be weighed up during the environmental impact assessment procedure. These alternatives might take into account different wind-farm technology or layout but there must be at least three viable alternative sites. This section sets out how the previous analysis should be carried out for selection of the sites to be assessed. This methodology does not take technical criteria into account or any others that bear no relation to the impact on bats and birds.

There is a widespread consensus of opinion about the importance of wind-farm site selection in terms of the negative impacts caused to bats and birds (Infante, 2006). In the first process phases, dealing with a specific site or plant-design proposal, it is essential to assess whether it is likely to have negative effects on birds. An initial analysis of the sensitivity of the site zone and of the design project and associated infrastructure will tell us the project's level of impact, whereupon alternative sites or designs can be selected.

A good initial site analysis will help not only to reduce the environmental impact but also to speed up the assessment and authorisation process, since there is by now a wealth of evidence showing that the projects with most environmental complications usually drag on longest and run a higher risk of being turned down in the end. This analysis therefore guarantees not only a lower environmental impact but also quicker decision-making processes for the developer, saving time and money.

A wind turbine's bird-kill probability is related to the population density of each species present in the study area and the likelihood of each species flying into the blades (on the basis of their flight height, their knowledge of the area, their habitat selection, their liking for human constructions, etc.). Areas with high bird densities should therefore be avoided, especially if they are prone to wind-turbine collisions or are threatened or listed. The total farm fatality rate, moreover, will be the sum of the mortality of each wind turbine, so farm size weighs heavily on its impact.


Photo: Simón/Sierra

Wind farms are all too often set up in habitat frequented by threatened species.


Photo: SEO/BirdLife

Griffon vulture after colliding with a wind turbine.

There is a series of variables that directly affect farm impact. These therefore allow a classification of potential wind-farm impact in a particular zone, on the basis of zone sensitivity and the size of the wind-farm project.

Table 3 shows the factors that exacerbate a wind farm's impact on bats and birds. Most of these factors are based on bird and bat density, the collision-proneness of the various species and the state of conservation of these species in the area. The other fundamental factor for ascertaining the potential impact in a particular zone is the size of the wind farm. This factor can in fact be broken down into two: the number of wind turbines and their capacity. Table 4 shows the way in which wind-farm size can be assessed. Finally, the potential impact on bats and birds of

POTENTIAL SENSITIVITY	FACTORS
Very high	• That the zone is frequented by species of bats or birds listed as *Vulnerables* (vulnerable), *Sensibles a la Alteración de su Hábitat* (sensitive to habitat alteration) or *En Peligro de Extinción* (In danger of Extinction) in the State (or regional) Catalogue of Threatened Species. • That the zone is frequented by species of bats or birds listed as *En Peligro de Extinción* (In danger of Extinction) or *En Peligro Crítico* (In Critical Danger) in the *Libro Rojo de las Aves de España* (Red Data Book of Birds of Spain). • That the zone contains areas declared as critical or sensitive for species of bats or birds in their corresponding recovery-, conservation- or management-plans. • That within 5 km of the zone there are large breeding colonies or roosts (herons, skuas, gulls, terns and waders, seabirds, raptors, etc.) • That within 15 km of the zone there are large breeding colonies or roosts of large raptors. • That within 5 km of the zone there are important bat refuges. • That the zone has been listed as a SPA, SCI (with presence of bats) or IBA. • That the zone lies between two SPAs, SCIs (with presence of bats) or IBA and less than 15 km from both. • That the zone has large flocks of waterbirds. • That the zone acts as a migration corridor for bats or birds. • That the zone has high densities of raptors. • That the zone contains at least one grid of very high importance for birds (Atienza *et al.* 2004).
High	• That the zone divides two wetlands or wooded areas. • That within 5 km of the zone there are small breeding colonies or roosts (herons, skuas, gulls, terns and waders, seabirds, raptors, etc.) • That the zone is frequented by species of bats or birds listed as *Vulnerables (vulnerable)* in the *Libro Rojo de las Aves de España* (Red Data Book of Birds of Spain). • That within 15 km of the zone there are small breeding colonies or roosts of large raptors. • That within 10 km there is a zone listed as a SPA, SCI (with presence of bats) or IBA.
Medium	• That the zone is recognised as an important regional or local bird area.
Low	• That the zone is affected by none of the above factors.

Table 3. *Factors for establishing the bird sensitivity of potential wind farm areas. If any single factor within each category is obtained, this automatically implies the designation of that environmental sensitivity category for the zone concerned.*

		Number of wind turbines				
		1-9	10-25	26-50	51-75	>75
Capacity	<10 MW	Small	Medium			
	10-50 MW	Medium	Medium	Large		
	50-75 MW		Large	Large	Large	
	75-100 MW		Large	Very Large	Very Large	
	>100 MW		Very Large	Very Large	Very Large	Very Large

Table 4. *Farm size assessment factors on the basis of the number of wind turbines and their capacity, with the aim of establishing the potential impact on bats and birds. Only possible combinations with present technology have been indicated.*

any project in a specific zone is shown in Table 5, in terms of the sensitivity of the zone and the wind-farm size, obtained from tables 3 and 4 (See Chart 3). **In general only projects with a medium or low potential impact should be considered as a viable alternative.** This first analysis should be included in the summary report that kicks off the environmental assessment procedure and in the subsequent authorisation (See Chart 4).

		Size			
		Very large	Large	Medium	Small
Sensitivity	Very high	Very high	Very high	High	High
	High	Very high	High	Medium	Medium
	Medium	High	Medium	Medium	Low
	Low	Medium	Medium	Low	Low

Table 5. *Potential wind-farm impact in a particular zone. The sensitivity and wind-farm size values are taken from tables 3 and 4. Only projected wind-farms with a medium or low potential impact should be considered to be viable alternatives.*

Chart 3 – Potential impact of a projected wind farm for bats and birds

Case study 1. Wind farm in Sierra de San Pedro.

A developer presented a project involving fifty 2-MW wind turbines in Sierra de San Pedro (Cáceres). A previous analysis showed that this zone had been designated as an IBA and SPA, with several pairs of Spanish imperial eagles, cinereous vultures, Bonelli's eagles, golden eagles, black stork, etc in the vicinity. In particular the area is critical for the Spanish imperial eagle, which has been listed as In Danger in the National Catalogue of Threatened Species and is covered by a Recovery Plan. Both the cinereous vulture and Bonelli's eagle have been listed as Sensitive to Habitat Alterations in the Regional Catalogue of Threatened Species and are covered by a Habitat Conservation Plan. In other words it is a very large project set in in a zone of very high sensitivity, whereby its potential impact is very high. This simple analysis would have ruled out presentation and assessment of this project, but the developer in fact presented it, financed the Environmental Impact Assessment Report and the Extremadura government turned it down. This is a clear example of a zone that could not be considered to be a viable alternative.

Case study 2. Wind farm in Hoces del Rudrón.

A developer proposed a 49.5 MW wind farm in Burgos with thirty three wind turbines in a zone lying 1 km from the SCI and SPA "Hoces del Alto Ebro y Rudrón" and 4 km from the SCI and SPA "Humada-Peña Amaya". These Special Protection Areas stand out for their populations of rock- and cliff-breeding birds, particularly the griffon vulture. These species, although they nest within the SPA, forage outside it. Given that cliff-breeding raptors are known to be affected by wind farms, the potential impact of the farm site should be considered to be high and it should therefore be ruled out as a viable alternative.

Case study 3. Wind farm in an industrial estate.

A developer proposed setting up a 12-MW wind farm of six wind turbines on the edge of an industrial estate on the island of Gran Canaria. This is a degraded area that nonetheless is frequented by birds listed as Vulnerable in the *Libro Rojo* due to their downward trend and restricted range (as endemic subspecies). The farm size, in view of the number and capacity of wind turbines should therefore be classed as medium, and its potential sensitivity as high due to the presence of these threatened species. These circumstances mean that the potential impact is medium, and that this alternative could be considered as viable for the environmental impact assessment procedure, although its definitive authorisation depends, among other aspects, on the detailed assessment of its impact.

Chart 4 – *Basic Information of the summary report*

The summary reports used for the previous consultation process (scoping) have to contain the following information over and above the information called for by current law (Article 6, Royal Legislative Degree [*Real Decreto Legislativo*: R.D.L]. 1/2008):

1) Description of the alternatives (including the coordinates of the various project items)
2) Analysis of the sensitivity of the zone and size of the projected wind farm as ascertained above. In particular all the aspects included in Table 3 have to be identified.
3) Identification and maps of all up-and-running wind farms and those still being authorised in a 50 km radius.
4) List of the species of bats and birds present in the zone, as recorded in the Atlas of Vertebrates, and classified by their threat status and degree of sensitivity to wind farms.

Determination of the area affected

Winged creatures like birds and bats are by nature mobile so a wind farm may have an environmental impact ranging much further than the physical area actually occupied by the various components. The first step in assessing the various alternatives is therefore to define the area affected (defined in Spanish EIA legislation as *"territorio o cuenca espacial"* or territory and spatial catchment area). The area affected would therefore be defined as the geographical area in relation to which the environmental impacts are to be estimated.

In most cases establishing the area affected is very difficult due to the relativity of the concept and the fact that different environmental factors might call for impacts to be assessed in different areas. A three-step analysis is put forward here for establishing limits based on ornithological values for projected wind farms:

Step one: Are there any vulture breeding colonies or roosts within a 50 km radius of the zone selected for the projected wind farm?

Vultures are one of the groups of birds most frequently killed by collisions with wind-turbine blades (Martí and Barrios, 1995; Janns, 2000; Lekuona, 2001; Durr, 2004; Barrios and Rodríguez, 2004; de Lucas *et al*., 2004). The scavenging habits of these raptors might also attract them to wind farms to feed on the carrion of birds previously killed by the wind turbines or livestock carcasses, thus increasing the collision risk of this threatened group of birds.

There are not many studies to go on in terms of ascertaining the hunting range of carrion-eating birds, though several studies have detected flights of at least 50-70 km from the breeding colony to feeding points for the griffon vulture (Donázar, 1993).

In the case of the cinereous vulture, the studies conducted by Costillo *et al*. in Extremadura show that this species might use vast areas of up to 250,000 hectares on average. The size of these hunting areas varies throughout the yearly cycle; unlike other raptors they have smaller hunting areas during the non-breeding season than during the breeding season. The size also varies in terms of the availability of food in the zone and from one individual bird to another, depending on whether they are breeding or not; non-breeding birds, indeed, tend to hunt over a wider area since they do not need to remain centred on the nest and can drop into other roosting areas (Costillo *et al*., in press).

It is therefore necessary to take into account the presence of breeding colonies or roosts of griffon vulture and cinereous vulture in a radius of at least 50 km around sites considered as alternatives.

Second step: Are there nests of big eagles or Egyptian vulture or roosts of Egyptian vulture in a 15 km radius around the zone selected for the projected wind farm?

The bigger eagles are not only very threatened birds but they are also prone to collide with the blades of the wind turbines. In fact there have been documented records on several wind farms of collisions of big raptors like the golden eagle *Aquila chrysaetos* (Thelander and Rugge, 2000; California Energy Commission, 1989; Erickson *et al*., 2001; Howell and Noone, 1992; Howell, 1997; Smallwood and Thelander, 2004; Lekuona, 2001) and white-tailed eagle *Haliaeetus albicilla* (Durr, 2004).

Special heed should be paid to distribution in the vicinity of pairs of Spanish imperial eagle, golden eagle and Bonelli's eagle. A check should also be made for any breeding populations or communal roosts of Egyptian vulture.

Although there have been few studies of the hunting area of these species, information to hand would suggest a minimum radius of 15 km should be considered. For example, a study of the use of space by eight breeding, radio-tracked Spanish imperial eagles (DGCN-CC.AA., 1998), showed they used a mean hunting area of 29,845 hectares (maximum 97,644 and minimum 2900).

The *comunidades autónomas* run updated annual population counts of Spanish imperial eagle and Bonelli's eagle. Another source of information here is the national Egyptian vulture count coordinated by SEO/BirdLife in 2000 (repeated in 2008). There are partial counts of golden eagle carried out in the nineties and some *comunidades autónomas* have more up-to-date information. SEO/BirdLife coordinated a national count in 2008.

Third step: Assume an affected area of 10 km for other species.

An area radiating out 10 km from the proposed wind farm sites should be taken into account for other species of birds and mammals.

Other considerations:

Although the three abovementioned steps cater for most cases, other affected-area factors might have to be taken into account, including, as the case may be, the following:

- If the projected wind farm might affect the values on the strength of which any site has been listed as a protected site or IBA, the affected area should be deemed to include the whole site.
- If there are wetlands less than 15 km away.
- If there are other wind farm projects in the vicinity, whether or not by the same developer.
- Dumps or landfill sites that might attract birds.
- Other natural values to be taken into account (scenery, sites of geological interest, etc.).
- Scavenger feeding sites.
- Known feeding sites of large raptors.
- Dispersal areas of large raptors.
- Bat colonies and refuges.

Due grounds must be given for determination of the affected area, backed up by inhouse maps to be used in assessing the various impacts on the environmental factors under study.

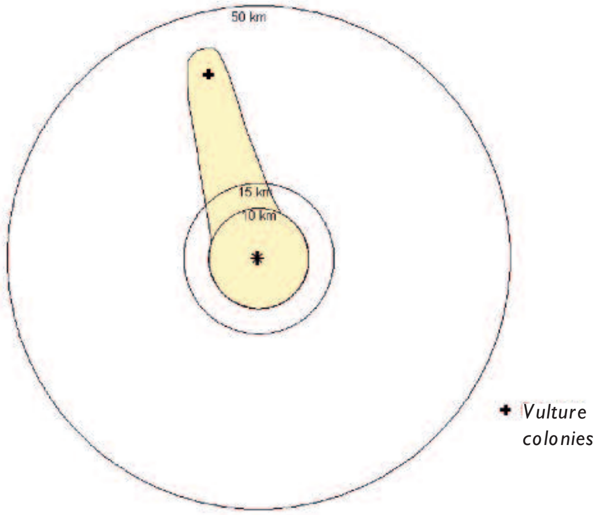
In no case will it be justifiable to analyse as the affected area only the polygon of the wind farm or the property on which the wind turbines are to be set up.

Determination of the affected area can never be based on administrative boundaries, whether municipal, provincial, regional or national. Consideration can be given only to those geographical or man-made factors that pose an effective barrier to the species under study.

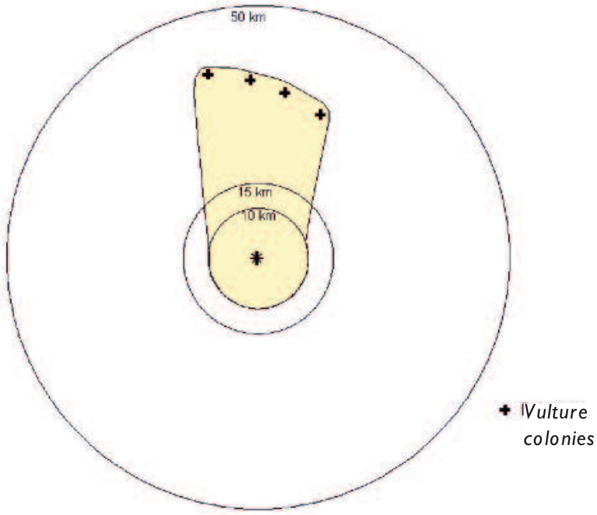
Photo: Ana Jancar

Savi's pipistrelle (*Hypsugo savii*) found dead under the turbines of a *wind farm in Croacia.*

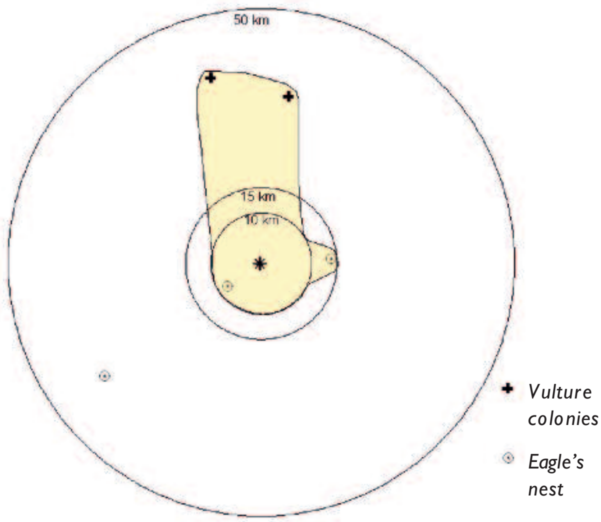
Chart 5. *Determination of the area affected.*



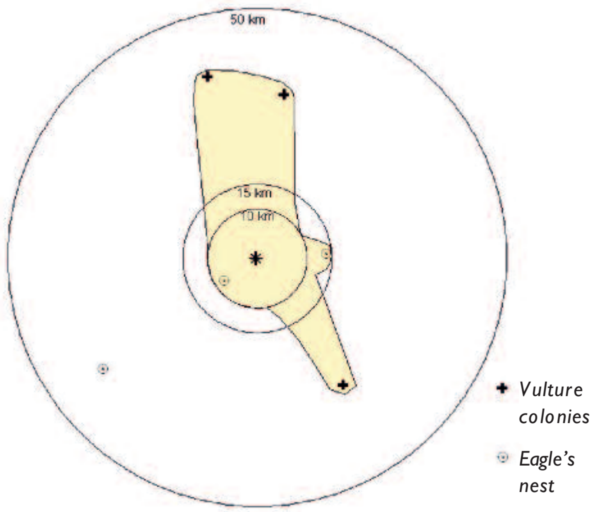
Case study 1. *A wind-farm project with a vulture colony at 45 km.*



Case study 2. *A wind-farm project with several vulture breeding colonies less than 50 km away.*



Case study 3. *A wind-farm project with several vulture colonies and eagles' nests at various distances.*



Case study 4. *A wind-farm project with several vulture colonies and eagles' nests*

Obtaining information

Once the area affected by the projected wind farm has been established, all environmental information pertaining thereto will be culled, with several objectives:

– Vet the information obtained in the previous analysis of zone sensitivity.
– Determine the manner in which birds make use of the area to assess the possible risks bound up with the wind farm.
– Glean preliminary information on the type and number of species that use the zone, to check this against the subsequent BACI analysis (Before-After/Control Impact) to be carried out in the follow-up programme.

Minimum necessary information

In any case the first step is to clarify the necessary assessment information to be able to focus efforts on obtaining it.

This section includes the minimum information that will be necessary for assessing the impact of projected wind farms on bats and birds. It stands to reason that, according to the particular characteristics of the proposed site, further particular information will have to be added on. Likewise, other information will have to be obtained to assess the impact on other environmental factors not dealt with herein.

Inventory

The *sine qua non* of a good assessment process is without doubt a good inventory. This calls for a knowledge not only of the species found throughout the year in the affected area but also their abundance and distribution. In general it is necessary to obtain the following information:

- Bird list.
- Distribution and abundance of breeding birds.
- Abundance and seasonal behavioural patterns of passage migrants.
- Distribution and abundance of wintering birds.
- Bird colonies or roosts (species, size, location).
- Flocks of migratory birds in stopover areas.
- Concentrations of raptors.
- Wader flocks.
- Distribution and abundance of birds that sing in the form of display flights.
- List of bat species.
- Distribution and abundance of breeding bats.
- Abundance and seasonal behavioural patterns of bats on passage.
- Bat colonies and refuges (species, size, location).

Counts should be conducted to estimate the abundance, or relative abundance, of breeding birds in the zone. These scope of these counts will vary directly with the size of the affected area, the size of the proposed wind farm and the complexity of the habitat where the count is to be conducted (for example, counts are more difficult in wooded areas than in farmland or wetlands).

These sample counts should be carried out by searching the study zone, for example by means of line transects or point counts, with a frequency depending on the birdlife of the area. They should also include an analysis of the birds' habitat use as well as the factors that might attract birds to the zone (sources of food) and if these factors are likely to differ from one year to another.

There are several manuals describing methodologies for obtaining information on the distribution and abundance of species using the affected area (e.g., Tellería, 1986; Bibby *et al*., 2000). In any case the methodology will have to be suitable for repetition during the operational phase (BACI analysis) as part of the environmental monitoring plan with the aim of finding out the real impact of the projected wind farm and determining the area in which there will be a fall in species abundance or richness.

In the case of bats, the suggestions of Eurobat could be followed (Rodrigues *et al*., 2008). This method includes the following basic characteristics for a suitable bat inventory:

a) Search for breeding colonies within a 5 km radius.

b) Monitoring of the activity.
   - By means of acoustic bat detectors (both manual and automatic) in all bat activity phases with the object of determining:
     1) an activity index, number of contacts per hour, for each habitat in the study area in a 1 km radius around the proposed wind farm site and for each wind turbine.
     2) Habitat selection by each species or group of species.
   - By means of infrared cameras for species on migration not using echolocation.

c) Monitoring of altitudinal use

   An activity index per species or groups of species, in all lifecycle stages at various heights should be obtained by using automatic bat detectors flown on balloons or kites, or, preferably, tower located, though any other suitable structure may be used. Special attention should be paid to the wind-turbine blade rotation height. This technique could be combined with radars and infrared cameras.

d) Sampling period

This will depend on the specific geographical conditions and the presence of species with very short hibernation periods. In any case the sampling intensity in the different sampling periods (and also the dates) can be checked in Rodrigues *et al*. (2008).

Use of Space

In Spain 10% of wind turbines account for between 40 and 60% of bird mortality (Alvaro Camiña *pers. com.*; Miguel Ferrer, *pers. com.*) so the location of each one of the wind turbines is a crucial bird-mortality factor of any wind farm. As well as finding out the species present and their population size, therefore, it is also necessary to find out their use of space in the vicinity of the farm site, since the impact on the various species will vary according to the habitat the wind farm is to be set up in, the species' habitat selection and conditions that determine the use of space (lie of the land, air currents, weather, etc.). For example, a nearby colony of lesser kestrels will be much less likely to collide with the blades if the wind farm is set up in the middle of a wood than in pastureland where these birds hunt. It is therefore necessary to work from at least the following information:

- Habitat selection of key species.
- Use of airspace around the theoretical wind turbine site (flying height, direction, abundance of birds and trajectory maps in wind farm implementation zones; suggested scale 1:25.000).
- Night-time use of space around the wind turbines (by means of mobile radars).
- Potential use of space around the possible wind turbine site by means of predictive wind-tunnel models. These analyses must be seasonal and take into account the prevailing weather conditions in the zone.
- Flight corridors of migratory birds.

For most species there are published documents on their habitat selection; for others, however, it would be necessary to take records in the field. For reasons of economy the obtaining of information can be restricted to a series of key species of bats and birds listed as Vulnerable, Sensitive to Habitat Alteration and In Danger in the National Catalogue of Threatened Species, the birds species in Annex I of the Birds Directive, the bat species included in annexes II and IV of the Habitats Directive and the bird and bat species listed as Vulnerable, In Danger and In Critical Danger in the Red Data Book.

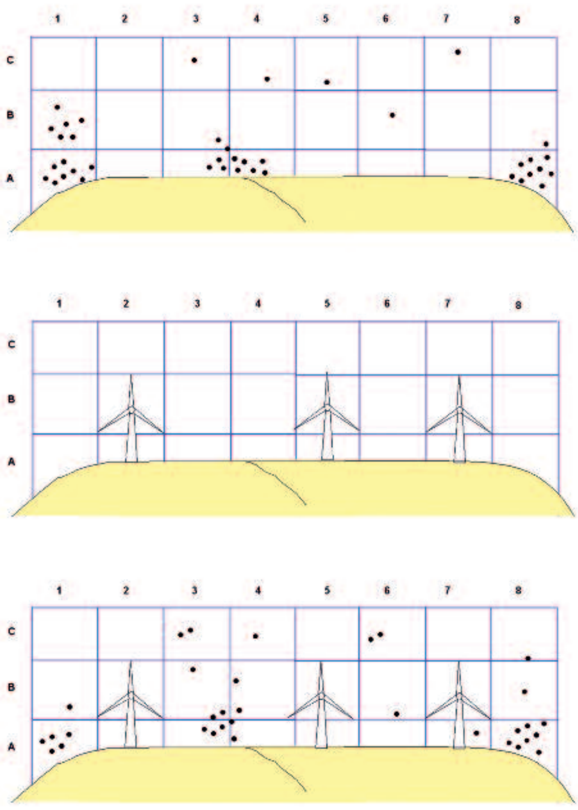
To obtain information on the use of airspace around possible wind turbine sites, it will be necessary to establish the most commonly used flightpaths in the zone and map them in detail. This information will have to be obtained by means of radars since direct fixed-point observations by expert ornithologists have been shown to detect hardly 20% of birds moving through the territory.

Radars can be used to establish air cubes and the number of birds using them in the interests of defining the best wind turbine site (See Chart 6). This could be done by means of grid-interpreted photographs taken from the fixed survey points. These can then be used to define the most often used corridors. The air cubes have to define zones below the blades, at the height of the blades and above them. Field observations must be seasonal and take into account all wind conditions existing in the zone, since different conditions determine different uses by birds. The number of samples must be enough for conducting the statistical analyses.

This information will have to be topped up with predictions based on scale models used in wind tunnels. These are relatively cheap models that enable forecasts to be made of air currents and winds under all known weather conditions in the zone.

Another way of determining the use of airspace is by real-time bird-detection systems. This new technology has

Chart 6. *Scheme for determining the use of airspace by birds and selection for wind turbine siting (the dots define points though which birds cross the air cube)*



certain advantages over the use of radar; for example it takes in a wider field of detection with a range from a few metres up to a kilometre, identifies species, operates in harsh weather conditions and operates continually on an unassisted basis. For all these reasons it is a user friendly data-recording system, especially useful in zones of difficult access or in dynamic environments such as the sea. The DTBird system, for example, has been set up in Asturias to assess seabirds' use of airspace in experimental offshore wind-power plant.

Habitat

The presence of bird species is conditional in turn on the presence of the different habitats. Furthermore, article 4.4 of Directive 79/409/EEC (Birds Directive) lays it down that Member States shall take appropriate steps to avoid pollution or deterioration of important bird habitats.

This calls for at least the following information:

- Detailed mapping of vegetation and habitat present.
- State of conservation of the habitats in the area affected.
- Amount of each habitat that will be destroyed or altered.

Spaces

There is a series of sites specially designated for the protection of birds or bats. All possible information on them should therefore be obtained, especially the site's conservation objectives (See article 6 of the Habitat Directive), the species on the strength of which it has been listed and the management plans or arrangements, if any, of the following types of sites:

- Special Protection Area (SPA).
- Sites of Community Importance (SCI).
- Special Areas of Conservation (SAC).
- Important Bird Areas (IBA).
- Important Mammal Areas (IMA).

Meteorological Data

Certain atmospheric conditions, such as mist or low cloud, might increase the risk of bird collision with wind turbines and power lines. Wind speed and collisions have also been found to bear a relation to each other. For this reason at least the following information has to be recorded:

- Wind speed and direction.
- Number of days with low visibility.

Photo: SEO/BirdLife

Griffon vultures have to live with the collision risk.

Human Use

One of the wind-farm impacts is an increase in site accessibility for pedestrians, motorised vehicles, etc. via the wind-farm access and maintenance roads and paths. This increase in access by human beings in turn increases the disturbance to fauna, road kill, fire risk, etc. This makes it necessary to assess the amount and type of human use of the zone and also the likely trend of this use in the future.

Sundry Aspects

Due consideration also has to be given to the following aspects:

- State of conservation of species present.
- State of protection of species present.
- List of species prone to collide with wind turbines.
- List of species prone to collide with power lines.
- Factors that might attract bird to the area (scavenger feeding sites, wetlands, landfill sites, etc.).
- Special topographical characteristics.

Information Culling Procedure

The information obtained has to be sufficiently thorough-going and extensive to ensure correct identification of the wind farm's likely impacts. Due account should therefore be given to published reference works and current legislation, which has to be in force and up to date. Field studies lasting at least one year will also have to be carried out. Given the importance of local geographical features, information should ideally be sought from local experts.

To this end the information culling process should be five-phase (See also Chart 7).

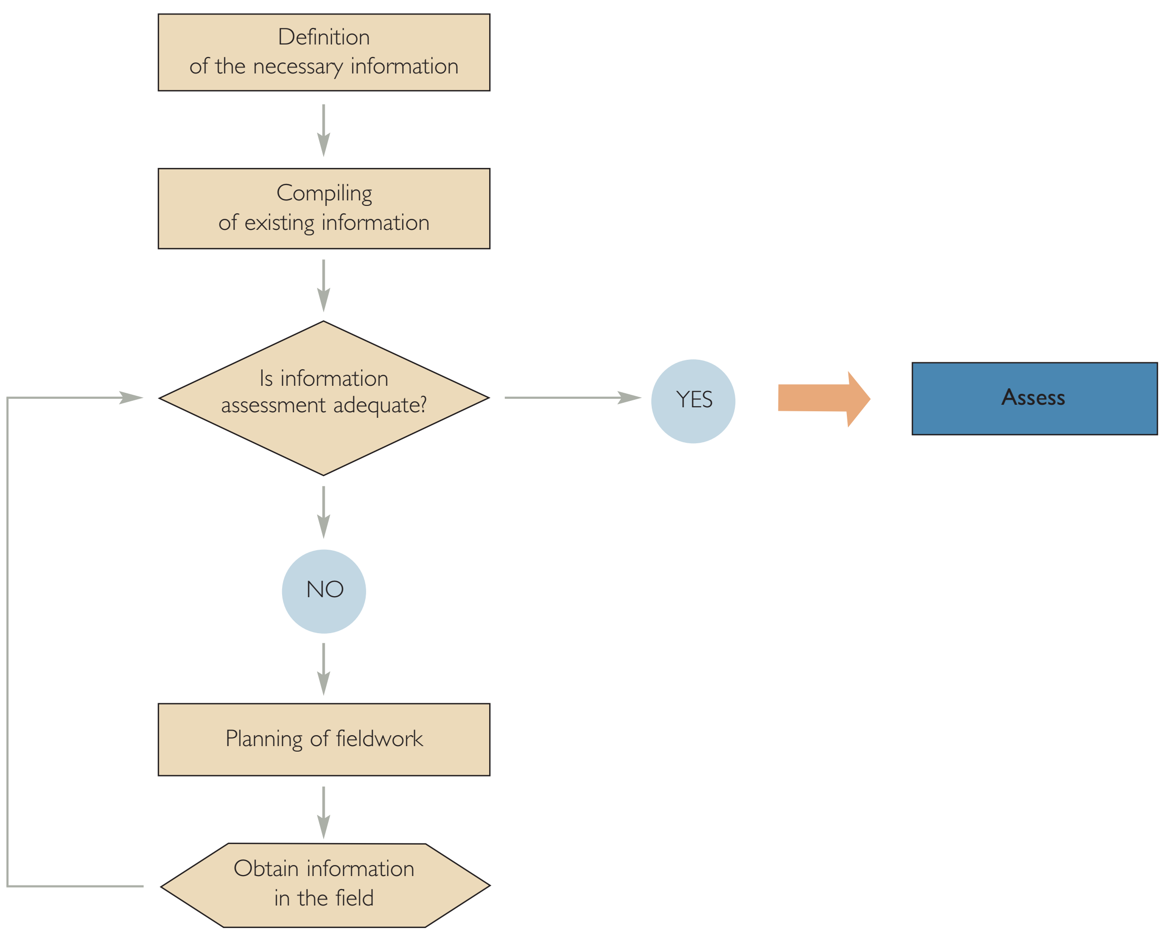
- ***Phase 1:*** Identification of the necessary assessment information.
- ***Phase 2:*** Compiling of existing information (based on available reference works, local experience, published inventories and meteorological information).
- ***Phase 3:*** Assessment of compiled information and of its quality.
- ***Phase 4:*** Planning of fieldwork to fill in any information gaps.
- ***Phase 5:*** Fieldwork for this particular study.

Annex III sets out the main information needs for wind farm assessment and some information-culling methods. Filling in this table should be compulsory for all environmental impact assessment reports.

Phase 1 - Identification of the necessary assessment information

The first step has to be to identify all information needed for the assessment. This step needs little time and will obviate time-consuming collection of superfluous informa-

Chart 7. *Flow diagram of the information culling procedure for assessment of wind-farm impact.*



tion or backtracking later when important information turns out to be missing. In general all projected wind farms call for at least the information itemised in Annex III.

Phase 2 - Compiling of existing information

1 - Existing reference works

Published information can be of great importance and input important facts and figures for the assessment process. An account will therefore now be given of the diverse sources to be checked.

- Environmental impact studies from other projects – A valuable initial check should be made of the environmental information on the particular area in question, such as the species using the site, types of habitats and vegetation, etc. An examination of other environmental impact studies carried out in the zone (not necessarily of wind farms) could bring valuable information into the trawl.
- Environmental monitoring plans from other wind-farm projects – Due consideration should also be given to the results of the monitoring projects of other wind farms, at least all those located in the same province, in neighbouring provinces or in areas sharing the same species. The objective here is to identify trends or similar problems that might be applicable to the zone of the particular project concerned. Existing interactions between these species and wind farms are probably also dealt with in the study, so identification thereof could help to create forecasting models to forestall future problems.
- Ornithological yearbooks – Another important source of information is ornithological yearbooks normally published by local birdwatching groups. These could input more specific and precise information on sensitive species or special situations, such as raptor roosts, cormorant roosts, migration routes, etc.
- Atlases and *libros rojos* (Red Data Books)– Atlases of breeding birds and mammals give a good initial snapshot. The inventory process, however, should not be based solely on these atlases due to the 10x10 km scale and skimpiness of some of them (e.g mammals). Moreover, the bird atlas does not even include wintering birds or migration stopovers. The *Libros Rojos*, for their part, input a lot of information on the state of conservation of the species and the threats hovering over them.
- Government reports – Environmental management powers and responsibilities have been fully devolved on regional governments. This spawns many field studies and ensuing reports that are highly useful for environmental impact studies. The most important ones include the official counts of specific species, studies for drawing up *planes de ordenación* (master plans for town and city planning), etc. The government, to avoid environmental impacts, is duty bound to grant public access to important environmental information in its possession.
- Scientific information – Any existing academic theses on bats and birds in the zone should also be brought into the trawl, as well as published scientific articles, etc.
- Site zoning and species recovery plans– These documents include mapped zoning with legal implications.

As already pointed out, the information used has to be thoroughgoing and truthful. Due distinction should also be made between scientific, technical and informative publications and unpublished reports, always indicating the publication date of the figures used.

2 - Local Experience

The participative character of the environmental impact assessment process means that consultation and dialogue should be phased into the whole process. Although there is an ever-increasing stock of published information there is still much knowledge and information that remains unpublished. It should also be borne in mind here that the environmental impact assessment fieldwork is unlikely to last more than one year, so there can be no recording of any phenomena that have a longer timeframe (e.g. irruptive wintering of certain species or wildfowl flocks in rainy years) or medium-term trends (e.g. species that are increasing or declining in this particular district). A due identification should therefore be made of all persons who might input information on the likely problems to crop up and how to deal with them, to find out their opinions and views.

Contacting experts familiar with the study zone can save time and also provide very useful information, since local experts can quickly pinpoint unpublished ornithological aspects or bring local considerations and observations into the picture plus other biological parameters to be taken into account. This consultation process should be orderly; local experience should therefore be properly documented in an appendix, indicating the selected persons or organisations and their inputs.

The local experts to be consulted should include at least the following:

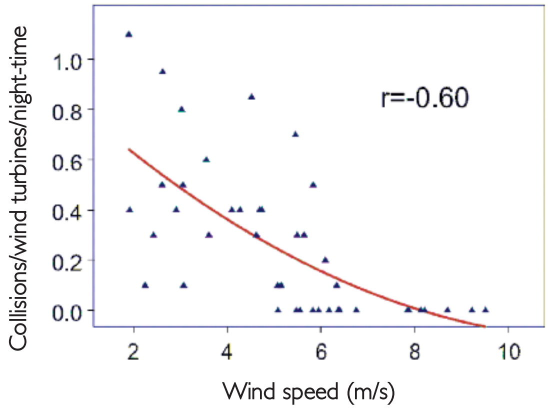
- SEO/BirdLife and especially its local groups.
- WWF/Adena and its local groups.

– Provincial conservationist groups.
– Forestry officers / local wardens / nature protection officers (*Agentes de Protección de la Naturaleza*: APNs).
– University professors and PhD students who have worked in the area on their theses and dissertations.
– Spanish Society for the Conservation and Study of Bats (*Sociedad Española para la Conservación y Estudio de los Murciélagos*: SECEMU).

On many occasions local experts refuse to cooperate because they fear that a third party –in this case a developer or consultancy– is going to benefit from their time-consuming fieldwork. It might therefore be necessary to explain to local experts that their information will help to avoid environmental impacts in this zone where they have spent so much time and effort. It would also be a good idea to pay them correspondingly for their input to the study. Environmental impact study budgets should therefore cater for the cost of obtaining this local-expert information, which could hardly be obtained otherwise.

Chart 8. *Relation between weather conditions and bat mortality.*

A study carried out on the wind farm of Meyersdale, Pennsylvania, showed a negative relation between prevailing wind strength and bat fatality rates. This is probably because bats tend to fly less when the wind is strong (Source: Arnett *et al.*, 2005).



3 - Natural Resource Inventories

The Ministry of the Environment and Rural and Marine Affairs (*Ministerio de Medio Ambiente y Medio Rural y Marino*), regional authorities and some NGOs (SEO/BirdLife, SECEM, SECEMU, AHE, etc.) run natural resource databases that could be used to determine whether one or several species sensitive to wind-farm impacts are likely to use the study area. These databases record information on species and also sites; in general they are more up-to-date than hard-copy publications.

These databases could furnish information on:

- Species likely to be adversely affected by wind farms (e.g. those that studies have shown to suffer the highest collision rate with wind turbines; See Annex I).
- Distribution of sensitive species.
- Natural values.
- Sensitive zones, like IBAs (Important Bird Areas), IMAs (Important Mammal Areas).
- Zones with high biodiversity for a particular zoological group.

4 - Meteorological data

The prevailing weather conditions in the area are important because they could exacerbate or, conversely, mitigate negative impacts on birds and bats. A relation, for example, has been found between adverse weather and the collision rate of bats and birds. In the case of birds, certain weather conditions like mist tend to increase the fatality rate, while reducing the fatality rates of bats, probably because they do not fly when weather conditions are such as to hinder their biological functions (See Chart 8).

Meteorological data of the affected zone will therefore be highly useful as the basis for forecasting potential effects on birdlife. Farms should not be set up in areas with many days of poor visibility and storms, especially when such weather conditions coincide with the biggest concentrations of birds (migration, etc.). The information recorded has to include at least the following:

– *Wind speed and direction:*
This information is obviously important for assessing the economic value of the wind farm and also for predicting the farm's effect on birdlife. Some studies, for example, have found a relation between wind speed and bird mortality, since wind turbulence reduces their ability to avoid the wind turbines or power lines. Some important wind data are: annual average wind speed, direction, distribution, intensity of turbulence and extreme wind (force and frequency).

– *Days of mist:*
Low-visibility conditions (for example less than 200 metres of horizontal visibility) normally bear a direct relation to bird collision risk (Langston and Pullan, 2002, 2003). Wind farms should therefore never be set up

in a zone with more than 20 days of mist a year. Mist maps are not yet available but they can be drawn up *ad hoc* from the information of weather stations closest to selected sites or those set up by park developers. Another option is to interview local people or even survey local crop- and livestock-farmers.

Phase 3 - Assessment of compiled information and of its quality

Once all existing information has been collected, an evaluation should then be made of whether it is sufficient in terms of quantity and quality for carrying out the environmental impact assessment. Any gaps should be filled in with *ad hoc* fieldwork. This evaluation should be done by building up a table from all the categories of information inventoried in Phase I with two adjacent columns weighing up its sufficiency for the task in hand. Annex III shows an example of such a table.

Photo: J. C. Atienza-SEO/BirdLife

Phase 4 - Planning of fieldwork to fill in information gaps

In most cases, unfortunately, there will be some gaps in the information needed for proper assessment of a project. As already pointed out, the information gaps pinpointed in Phase 3 have to be filled in with *ad hoc* fieldwork. As in any other facet, the planning phase is crucial to ensure that the fieldwork is well directed, saving time and resources in the long run. By this time the information availability dates will also be known and the evaluation can thus begin. Until this moment it will probably be difficult to give the developer any trustworthy impact-study delivery date.

Photo: J. C. Atienza-SEO/BirdLife

Collision with the blades of wind turbines is a direct cause of death.

This phase has to set out the methodology (including dates and effort) to be used for filling in missing information. *Ad hoc* measures will usually have to be sought.

Phase 5 - Fieldwork

This phase is very important because it will fill in all missing assessment information. Ideally, the work should be carried out by multidisciplinary teams familiar with the information-obtaining methods. A good solution might be to commission specific studies from university teams.

A crucial factor here is that the fieldworkers contracted for this phase have the necessary expertise to identify on sight or by song or call all birds that might crop up in the zone. In the case of bats it is equally vital that fieldworkers should be familiar with bat detection and identification techniques. The developer will have to vouch for this capacity by means of documents (for example, in the case of birds, by the fieldworker's participation in bird-surveying schemes like SEO's common breeding bird survey [SACRE] or any other that calls for the ability to identify birds by eye or ear).

Impact Assessment

It is a striking fact that every environmental impact study carried out to date tends to assess the impact of wind farms using very different criteria. Ostensibly, however, the selfsame criteria should be used in each case since the same type of project is being assessed each time, presenting the same type of impacts caused by the same actions.

For this reason an account is now given of how the assessment *per se* should be conducted.

Impact of projected wind farms

At least the following impacts on flora and fauna should be taken into account:

Direct Impacts:

Habitat loss. The setting up of wind turbines and associated infrastructure, such as power lines and access roads, spells habitat transformation or loss. The loss and alteration of habitat is without doubt one of the biggest threats to fauna (Coulson and Crockford, 1995; Madroño *et al.*, 2004). Loss of habitat can then have many knock-on effects on animal populations. If this loss occurs in breeding areas the species' population will shrink; if in wintering areas the result might be, again, a drop in population or unforeseeable changes in migration routes (Dolman and Southerland, 1995).

Collisions. Collisions with the moving blades, with the tower or associated infrastructure such as the power lines are causes of direct mortality. As well as direct strike with the blades, the rotor might also cause turbulence injuries.

Disturbance. Wind turbines entail a certain disturbance level, forcing birds to frequent the zone less or even desert it altogether. If deserting birds are then unable to find alternatives within their preferential habitat there may be a knock-on reduction in their breeding success and survival rate, due to the increased energy expenditure in finding makeshift territories. The disturbance might result from the wind turbines themselves or the presence of vehicles and persons during construction work and ongoing maintenance tasks. Much of the disturbance will stem from the increased accessibility of the zone, allowing use of a hitherto isolated site by motorbikes, quads, walkers, etc.

Barrier effect. Wind farms set up a barrier impeding bird mobility, fragmenting feeding, wintering, breeding and moulting areas. The skirting of wind farms also represents an increased energy expenditure that might impair their physical state. This effect may be produced by a large linear wind farm or by the cumulative effect of several smaller farms. One of the main consequences of the construction of infrastructure of this type could be the creation of an artificial barrier to the movements of individuals and populations. In the first instance this might lead to reshuffling of the territories of various individuals occupying the immediate vicinity of the infrastructure; in the final instance it could produce different demographic and genetic processes that increase the likelihood of a given population being wiped out completely (Fahrig and Merriam, 1994).

Destruction of clutches and broods. There could be a direct effect on the breeding success of top-priority animals. This impact almost exclusively occurs during the construction phase. This effect usually bears a direct relation to land surface occupied and the quality of the habitat.

Indirect impacts:

The building and running of a wind farm involve the construction and installation of other auxiliary items such as grid access lines. These items in turn generate a series of their own negative impacts on the environment: habitat alteration and loss, destruction of clutches and broods, disturbance, electrocutions, electromagnetic effects, erosion, alteration of water flows, etc.

Induced impacts:

There is a resulting increase in human pressure on natural ecosystems. In particular there might be an increase in hunting and egg-collecting pressure, the risk of human-caused fires, etc. Access roads and paths come to be habitually used by cars and walkers, etc., possibly leading to a decrease in the breeding success of some species or even their total desertion of the site.

Cumulative impacts:

The grouping of wind farms in space multiplies their negative effects on birds by worsening the barrier effect and increasing the number of collisions. There may also be cumulative effects with other infrastructure of the zone (e.g. many passerines are not only prone to collide with the rotating blades but also to fly into vehicles running along the nearby roads).

Study of the synergistic effect

Any environmental impact assessment has to include a chapter dealing with the cumulative and synergistic impacts of all the wind farms, up-and-running or in the pipeline, and also all the associated infrastructure (grid-access power lines, electricity substations, access roads, etc.). This entails asking the government for a list and basic data of each one of these projects (siting of wind turbines and substations, routing of power lines and roads, etc.) and also searching the *boletines oficiales* (official journals of published legislation) to detect all projects being dealt with in the area. To define the territorial scope over which the impact should be assessed, we can fall back on the criteria defined by the courts:

1) Other nearby wind farms. For example, those farms lying within 10-15 km of the farm now being dealt with.
2) Several farms affecting the same protected site. This is to say, if the project under assessment could have an effect on a protected site, singly or in conjunction with other nearby farms, their affect thereon should be judged as a whole. The study scope would hence be defined by the protected site and its environs; this might entail assessing farms lying a long way from the initially assessed project.
3) Several farms affecting the same natural element, for example the same population of a threatened species. In this case the territorial scope would be defined by the range of this population and the distribution of the farms or projected farms that might affect them.

When there are several projected wind farms planned for the same zone, it is usually more effective for all the developers to reach an agreement to carry out a single study of the synergistic impact. Witness the example of the wind-power development in *Tierras Altas de Medinaceli* (Soria), although in this case it was not done properly because it was carried out after farm authorisation rather than beforehand.

The first aspect to be defined, therefore, is the items to be taken into account in the assessment (species, habitats or protected sites) and *ipso facto* the scope of the procedure. A study of the synergistic impact will necessarily involve the participation of specialists in the items to be assessed.

Studies of the cumulative and synergistic impact have to take into account at least the following factors:

1) Grounds for deciding on the natural elements to be taken into account in the assessment (species, habitats and protected sites).
2) Grounds for the scope of the analysis on the basis of the elements and projects to be assessed.
3) Description of the projects considered in the analysis, containing at least detailed mapping thereof and their main features (capacity and height of the wind turbines, surface area of tracks and platforms, characteristics of the power line, etc.).
4) Description of the natural elements taken into account. In the case of species and habitats there must be a detailed description of their biological characteristics that make them likely to suffer harm from the projects under study. In the case of sites, a determination has to be made of the key site species and habitats to be studied, with due description of the levels of impact to be considered as acceptable insofar as the projected farms would not alter the integrity of the site or its conservation objectives.
5) Description of the situation of the natural elements taken into account in the scope of the analysis. For species a description shall be given at least of their population size, habitat selection, distribution and availability. And for sites, their conservation objectives and any existing management instruments. If any such instruments do exist then an analysis will be given of their compatibility with wind-power development. All these elements should be identified on maps.
6) Description of the impacts of each projected wind farm on each one of the elements. At least the following impacts will have to be assessed:
   - Analysis of species abundance and its relation to the habitat area affected by the wind farms
   - Collision risk
   - Habitat disruption
   - Direct habitat loss
   - Indirect habitat loss
   - In the case of fragmented habitats the effect on the functionality of the broken-up pieces of habitat
   - Effect on territories
   - Predation risk induced by the increase in non-specialist predators
   - Breaking up the ecological connectivity of populations

   In all cases this description has to be quantitative and based on the best existing scientific knowledge. The information has to be displayed in such a way as to bring out all the individual and cumulative impacts.
7) Proposed corrective measures.
8) Predictive-model assessment of the effect of the various projected wind farms on the natural elements

under study. The model has to take into account not only the cumulative impact but also any synergistic impacts that might occur. The result, in the case of species, will be an analysis of population viability to determine the population size that would result if all the projected wind farms actually came to be built.

All projects will not necessarily have the same effect so an analysis should be made on the basis of different scenarios. The starting scenario would be up-and-running wind farms, then phasing in new scenarios with approved but not yet constructed wind farms and finally those that are still in the process of being authorised. This would lead to the identification of different scenarios with their corresponding cumulative and synergistic impact on the elements under study.

The models have to take into account the situation both with and without application of proposed corrective measures. The aim here is to assess directly the residual impact of the group of projects.

This study would probably call for specific fieldwork and complex analyses, so it is crucial for this to be taken on board from the word go to avoid unnecessary delays later on.

Actions of projected wind farms likely to produce an impact

Actions to be duly assessed in projects of this type have to include at least the following:

Construction Phase:

a) Permanent occupation of land
b) Temporary occupation of land
c) Movement and operation of machinery
d) Earth movements
e) Blasting
f) Demand for materials
g) Disposal of materials
h) Installation of drains
i) Channelling of watercourses
j) Embankments and land clearance
k) Scrub clearance
l) Land levelling
m) Construction of access and maintenance roads
n) Chemical or mechanical control of vegetation
o) Enclosures

Operation Phase:

a) Permanent occupation of land
b) Movement and operation of machinery (including wind turbines)
c) Scrub clearance
d) Chemical or mechanical control of vegetation
e) Enclosures
f) Vehicle movements and emissions

Characterisation and overall evaluation of impacts

The characterisation and overall evaluation of impacts has to be similar across all projects, since the impacts are exactly the same for these general purposes. Quite another thing is the particular evaluation of each impact in the zone proposed for each project.

Impact characterisation and evaluation should be as follows for all projects:

In light of the characterisation of each impact, an evaluation thereof can then be made. Clearly, any negative impact that is characterised as synergistic, cumulative, permanent, irrecoverable, with a direct incidence and widespread projection should be evaluated as much more negative that any type of simple, intermediate, recoverable, localised and reversible impact. The various impacts have therefore been evaluated as very high, high or moderate (See the last column of Table 6).

Photo: Niko López

Cumulative impact: electricity distribution lines, transmission power lines, wind turbines and meteorological towers.

	Nature	Character	Duration	Recoverability	Spatial projection	Reversibility	Incidence	Evaluation
Habitat loss	Negative	Synergistic	Permanent[1]	Irrecoverable	Surrounding area[2]	Irreversible	Direct	Very high
Barrier effect	Negative	Cumulative-synergistic	Permanent	Recoverable	Extensive	Irreversible	Direct	High
Disturbance	Negative	Simple	Permanent[3]	Diffuse	Surrounding area	Irreversible	Direct	Medium
Destruction of clutches and broods	Negative	Cumulative	Intermediate	Recoverable	Localised	Irreversible[4]	Direct	Medium
Collision	Negative	Simple cumulative	Permanent	Irrecoverable	Surrounding area	Irreversible[5]	Direct	Moderate high

Table 6. *Characterizations and overall evaluation of the impact according to the definitions of RD 1131/1988*

1. *The area occupied by the wind farm including wind turbines, substation and roads and paths).*
2. *Spatial projection is taken here to mean the type of global effect in the study area.*
3. *The impact will be permanent during wind farm operation but periodic and irregular in nature.*
4. *Depending on whether or not the species affected has a breeding response capacity special attention should therefore be paid here to the state of conservation of the species involved.*
5. *Irreversible if the individuals directly affected are considered.*

Assessment

Once each of the environmental impacts, considered globally, has been qualitatively evaluated (in the previous section), a more detailed and differentiated assessment then needs to be made of the gravity of the same impact and even whether it exists or not in the various individual projects. To this end, in the interests of maximum objectivity, a definition is given in the following table of the impact evaluation criteria, based on conservationist and legal aspects.

Wind farms set up near feeding zones like scavenger feedings stations can take a heavy toll on birdlife.

EFFECT (Characterisation)	CRITERIA	EVALUATION
Habitat loss (Very high)	If habitat is destroyed in an area critical for a Globally Threatened species or a species In Danger of Extinction or Sensitive to Alteration of its Habitat or any priority habitat of Annex I of the Habitats Directive.	CRITICAL
	If habitat is destroyed in an area critical for a species of Annex I of the Birds Directive or Annex II of the Habitats Directive, or any habitat of Annex I of the Habitats Directive	SEVERE
	If habitat is destroyed in an area important for a species listed as Vulnerable	MODERATE
	If it does not affect essential habitat for singular species	COMPATIBLE
Disturbance (Medium)	If it represents a threat for a Globally Threatened species or a species In Danger of Extinction o Sensitive to Alteration of its Habitat	CRITICAL
	If it represents a threat for a species of Annex I of the Birds Directive or Annex II of the Habitats Directive	SEVERE
	If it represents a threat for a species listed as Vulnerable	MODERATE
	If it does not affect singular species	COMPATIBLE
Barrier effect (High)	If it could affect Globally Threatened species or a species In Danger of Extinction or Sensitive to Alteration of its Habitat or if it is a migration stopover point	CRITICAL
	If it represents a threat for a species of Annex I of the Birds Directive or Annex II of the Habitats Directive	SEVERE
	If it represents a threat for a species listed as Vulnerable	MODERATE
	If it does not affect singular species	COMPATIBLE
Collision or electrocution (Medium/High)	If it could affect Globally Threatened species or a species In Danger of Extinction or Sensitive to Alteration of its Habitat or if it is a migration stopover point	CRITICAL
	If it represents a threat for a species of Annex I of the Birds Directive or Annex II of the Habitats Directive	SEVERE
	If it represents a threat for a species listed as Vulnerable	MODERATE
	In no case	COMPATIBLE
Destruction of clutches or broods (Medium)	If it destroys clutches of Globally Threatened species or a species In Danger of Extinction or Sensitive to Alteration of its Habitat	CRITICAL
	If it destroys clutches of species listed in Annex I of the Birds Directive or Annex II of the Habitats Directive	SEVERE
	If the habitat is of high quality but does not *a priori* affect singular species	MODERATE
	If no clutches of singular species are destroyed	COMPATIBLE

It goes without saying that proper use of these objective criteria depends on sound information beforehand. Authorisation should never be given to any project that produces at least one critical or severe impact in effects categorised as high or very high.

NATURA 2000 NETWORK: FARMS CLOSE TO PROTECTED SITES

Spain has opted to base nature conservation largely on site protection. It has therefore designated sites deriving from international legislation (SCI and SPA), from national and regional legislation (*espacios naturales protegidos* or protected nature sites) or international conventions ratified by the Spanish state (Biosphere Reserves, Ramsar wetlands, etc.). The assessment procedure should therefore spare no effort in finding out if the project impact area takes in any of these sites and has a negative effect thereon. Consideration must also be given to the legal effects of any of these site-conservation schemes, guaranteeing that the project is not incompatible with any site management plans. A great effort should also be made to identify the values on the strength of which each site has been declared as such, assessing the project's effect on each one of these values.

Whenever a project might affect one of these sites, therefore, the EIA report has to include the whole site in its analysis; this is the only way of ensuring the following: (1) appreciation of the representation of the habitats and species associated in the site and (2) perception of the project impact in terms of the relative alteration of said habitats and species, for whose conservation it was initially listed as a Natura 2000 protected site.

Impact on Natura 2000

Article 6 of Directive 92/42/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) lays it down that "Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive".

Moreover, "any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives". Any assessment carried out pursuant to section 3 of article 6 has to concentrate on the implications for the site in view of its conservation objectives. According to the Manual of the European Commission on application of article 6 of the Habitats Directive (European Commission, 2000) these would be the objectives established by each Member State for each one of the natural habitat types of Annex I and the species of Annex II present on the sites, except those identified as "non-significant", which can be exempted from this assessment. The manual indicates that these species are listed in the official site-designation forms and that the place where the site conservation objectives should be determined is the management plan. Unfortunately, however, the Spanish state has not yet drawn up the management plan for most sites. Nonetheless, if subsequent fauna studies or the EIA inventory should record presence in the area of species listed in the annexes of the Habitats Directive or Birds Directive, which indicate the species and habitats for which sites should be declared, an appropriate assessment must then be made of the impact on these species and habitats, unless their presence is recorded as "non-significant".

In this case the Habitats Directive also calls for an assessment of alternatives that differs from conventional analysis of alternatives carried out under the EIA Directive (Dir. 85/337/EEC). This assessment of alternative plans or projects that might affect Natura 2000 sites has to be done appropriately; in the European Commission's judgement this means that:

a. The assessment of alternatives has the sole aim of ensuring that the impact on the Natura 2000 network is zero or as near zero as possible.
b. The only factors to be considered are environmental criteria, specifically the possible impact on the affected site's conservation objectives (this includes all the species and habitats for which the site was declared, i.e., all those included "significantly" in Annex I of the Habitats Directive and Annex II of the Birds Directive).
c. The 'zero-option' should be considered too.

A *de facto* result of these conditions is that two studies of alternatives have to be carried out for those projects calling for a regulated environmental impact assessment, since, under the Habitats Directive no incorporation can be made of social or economic variables of those of any ilk, which have to be taken into account pursuant to the EIA Directive.

It should be remembered here that if there are negative impacts for the site or if there are geographical alternatives or different project options that avoid the impact on these sites, then the project cannot be authorised except by way of an expensive and complicated exceptions procedure. The only way of qualifying for this exceptions procedure is if the project has to be carried out for imperative reasons of overriding public interest, including of a social or economic nature. In this case all necessary measures would have to be taken to offset the impact on the site and guarantee the overall coherence of Natura 2000 network. The European Commission must also be duly informed of the compensatory measures taken. But the measures are even more restrictive in sites hosting a priority type of natural habitat or species (birds and bats listed as In Danger under article 45 of *Ley* 42/2007), where the only valid arguments are human health, public safety and beneficial consequences of primary importance for the environment or, after previous vetting by the Commission, other imperative reasons of overriding public interest. None of these conditions would be met by a projected wind farm.

The European Commission manual is forthright about the fact that the mere existence of a probable impact would then necessarily invoke implementation of the procedure laid down in article 6 of the Habitats Directive. It is equally forthright about the fact that a project does not necessary have to be carried out inside a Natura 2000 site to have an impact thereon. This is a crucial condition to bear in mind in wind farm projects, which, by their very nature, can damage winged fauna without actually being located in the site designated for species protection. This means that any project bordering on Natura 2000 sites that have been declared for the protection of birds and bats obviously calls for an article 6 assessment. It has to be borne firmly in mind here that birds and bats bear the brunt of projects of this type; by their very nature this winged fauna is very mobile and may often move outside the Natura 2000 site on their routine flights.

In general an assessment must be made of its impact on a Natura 2000 site if the project is inside the site, less than 10 km from its border, 15 km from its border if the site has large raptors and 50 km if the site has large scavenging raptors.

European Commission: Wind Energy Developments and Natura 2000

In October 2010 the European Commission brought out a guidance document on wind energy with the main aim of ensuring that wind-energy developments are compatible with the Birds and Habitats Directives. The document was drawn up mainly to serve as a guide for developers, competent authorities, site managers and all bodies involved in the planning, design, implementation or approval of these projects.

While the guide was being drawn up, a specific working group was set up to glean as much information as possible from all stakeholders. SEO/BirdLife and BirdLife International took an active part in this working group.

In various chapters the guidance document sets out the applicable legislation framework from the environmental point of view, the potential impacts of these developments on nature, the importance of strategic planning in wind-farm developments and a step-by-step procedure for wind farm developments affecting Natura 2000 sites under article 6 of the Habitats Directive.

A summary is given below of the main points of this guide:

- Like climate change and renewable energy, biodiversity conservation is also high on the EU political agenda.
- Wind farms probably have an adverse effect on Natura 2000 sites so they should be subjected to an appropriate assessment in light of the site's conservation objectives.
- Studies suggest that various species of birds, bats and marine animals may be particularly vulnerable. The type and degree of impact is very much dependent upon a range of factors, such as location and the type of species present. The potential impacts must therefore be examined on a case by case basis.
- Scientific studies and monitoring work undertaken in relation to existing and future wind farm developments are an invaluable source of information. Wind farm developers as well as planners, scientists and NGOs have a key role to play in building up the information base on the interactions between wind farms and wildlife and the species that may be affected.
- Planning wind farm developments in a strategic manner over a broad geographical area is one of the most effective means of minimising the impacts of wind farms on nature and wildlife early on in the planning process. It not only leads to a more integrated development framework but should also reduce the risk of difficulties and delays at later stages at the level of individual projects.
- Developing wildlife sensitivity maps at the strategic planning stage enables areas to be identified where wind farm development might be considered a low, medium or high risk for bats and birds in certain areas or sites. Several Member States have demonstrated how this can be done with success.
- The purpose of the Appropriate Assessment (AA) is to assess the implications of the plan or project in respect of the site's conservation objectives, individually or in combination with other plans or projects. The Appropriate Assessment should focus on the species and habitats that have justified the site's designation as a Natura 2000 site.
- Article 6 of the Habitats Directive should be applied to all those plans or projects that are likely to have a significant effect on a Natura 2000 site.

This guide cannot be considered as a manual for assessing wind farm impact on birds or mammals since it includes no methodology for identifying, assessing, supervising or mitigating the negative effects caused by this industrial infrastructure. For this reason SEO/BirdLife has considered it necessary to draw up these guidelines.

PREVENTIVE AND CORRECTIVE MEASURES

Preventive and corrective measures are, without a shadow of a doubt, one of the crucial parts of environmental impact studies in terms of preventing or reducing any negative effects. **Corrective measures** aim to reduce or minimise the negative impact, limiting the intensity of the impacting action. Preventive measures, for their part, aim to eliminate the cause of the impact completely, pre-empting its occurrence; they should therefore be adopted in the project design phase.

In cases where the impact assessment procedure has established that certain actions will have negative effects on threatened or sensitive species, or species of conservation interest, an identification should then be made of the most appropriate corrective measures.

One of the most important wind-farm impacts on birdlife is mortality from collision with the wind turbines. If there is **no clear** relation between the risk estimated in the EIA report and the actual bird fatality rate detected once the wind farms have been built (Ferrer, *et al*. 2011), the conclusion can then be drawn that the mortality-reducing corrective measures proposed in the EIA report are not proving to be effective.

The design of appropriate measures should take into account all the following:

– That mortality from collision with wind turbines is species-specific, so the appropriate measures for one species might not work for another.
– The number of birds observed during the pre-construction phase is not necessarily a good mortality forecaster; mortality depends also on the behaviour of the species in question.

There are some general measures for reducing the rate of bird collision with wind turbines, such as:

– Increasing blade visibility by painting them with a distinctive colour or coating them in UV-reflecting paint (Hötker *et al.*, 2006; Drewitt & Langston 2006).
– Wind turbines that work at a low rotation rate are preferable (turbines of this type are most commonly used in offshore farms).

Image loaned by DTBird showing how this remote detection system detects the presence of birds in flight.

– Shutting down the turbines helps to reduce collision risk, especially at night during migration times or when weather conditions are bad (Hötker *et al*., 2006; Fox *et al*., 2006; Hüppop *et al*., 2006). This measure is highly useful for problematic wind turbines where several collision events occur.
– To reduce the number of birds drawn in by the aeronautical warning lights, it is recommendable during periods of poor visibility to use flashing safety lights instead of constant lighting (Hötker *et al*,. 2006; Hüppop *et al*., 2006; Blew *et al*., 2008).

These measures are not 100% effective but they may help to reduce the risk for certain species.

It is for this reason that other types of bird-collision prevention measures should be compulsory for wind-farm authorisation. Remote detection systems are the best technology currently available for this purpose. These detect flying birds in real time and trigger automatic warning systems, shutting down the wind turbines when flying birds have been present during the collision risk zone for a set period of time.

Real Time Bird Detection

The DTBird system has now been fitted in two Spanish wind farms (Zaragoza and Navarre), apparently giving good results. Fitting a system of this type or a similar one has also been included as a fauna protection measure in the Decision to grant development consent of the Alba de Tormes wind farm (Salamanca) (BOCYL, 13 September 2011, Decision of *the Dirección General de Calidad y Sostenibilidad Ambiental* [Directorate General of Environmental Sustainability and Quality]).

Another additional advantage of systems of this type is the possibility of automatic recording of the number of actual collisions per wind turbine as part of the environmental surveillance system.

Assessment of the effectiveness of the corrective measures proposed in the EIA report should begin as soon as the farm has been commissioned. Where a higher than expected bird fatality rate has been detected, additional corrective measures should be taken. This would call for an assessment of existing alternatives or the development of new measures.

ENVIRONMENTAL MONITORING PROGRAMME IN OPERATION PHASE

Although the main wind-farm impacts have already been described, the actual scope of this problem in Spain is unknown, despite the large number of up-and-running wind farms and the fact that Spain is one of the wind-farm pioneers at world level. Two of the reasons for such ignorance are the disparity of environmental monitoring criteria and implementation of incomplete or poorly directed methodologies that lack, for example, adjustment factors to allow for search efficiency and scavenger predation. The upshot is that the real impact of wind farms on bats and birds is almost certainly being underestimated (See for example Carrete *et al*., 2009, Tellería, 2009c).

There is therefore an urgent need for standardised impact monitoring methods of wind-farm impact on bats and birds at national level to find out the real impact and strike the right balance between the harnessing of a renewable energy source like wind and the conservation of nature and the environment.

The best way of doing this is to set up appropriate environmental monitoring programmes (EMP) to fulfil the following objectives:

1) find out the real impact of the authorised wind farm
2) establish corrective measures if significant impacts are being produced
3) improve future wind farm projects and
4) improve the environmental impact assessment procedure by fine-tuning impact forecasting models.

All these aspects of the EMP must be coordinated by means of minimum, easily repeatable guidelines that ensure a uniform flow of information.

Along these lines an account is given below of the basic aspects to be considered in all EMPs of up-and-running wind farms:

1) Monitoring at least fortnightly of total wind-turbine and power-line mortality during the first three years of operation, to pinpoint any temporal or structural patterns in bird or bat mortality (especially problematic wind turbines, power-line sections with a higher fatality rate, coincidence with important biological periods for the species, etc.)

2) Establishment of a standard wind-farm carcass recording protocol coordinated with all competent authorities, especially in the case of threatened species (IUCN criteria) or legally protected species. In these situations the protocol should include immediate communication of the incident to the competent authority.

3) As from the fourth year of the coming into force of the EMP in operation phase, the monitoring effort could be scaled down in light of the impacts found for each specific farm. If any time-related mortality peaks have come to light, particularly problematic layouts or any other pattern, ongoing efforts could then be adjusted accordingly. In any case this "scaled-down" monitoring will be kept up throughout the whole useful life of the facility (see below) taking in never fewer than 10 or 10% of installed wind turbines. To confirm that changes in the use of the space by wildlife have not modified the wind-turbine mortality pattern, all wind turbines should be checked each season regardless of how long the wind farm has been up and running.

4) The EMP will take in any efficient impact mitigation measure regardless of production needs in known cases of particularly hazardous plant (wind turbines or power line sections) or peak mortality moments. These shall include total shutdown of the problematic machine(s) during the risk periods or definitive shutdown thereof in cases where it is not possible to minimise or eliminate the impact, and modification of power-line routes or infrastructure or burying thereof in the absence of any other mortality-reducing solutions.

5) A study will be conducted to assess the scavenger removal rate and searcher detection rate, applying equations to correct the detected fatality rate accordingly. Studies of this sort should be designed to allow for the different sizes of the birds and seasonal differences in the habitats of the wind-farm site, especially when environmental conditions differ markedly at different times of the year (snowfall, change in height of the vegetation, floods, etc.). Specific studies should also be carried out to establish the removal-detection rate for bats and small birds.

6) A six-monthly report will be written and sent up to the competent authority, recording at least the following content:

   a) An initial summary giving a quick idea of the species and number of carcasses found, their listing in categories of threatened species, the number of days spent on the search, the number of wind turbines and kilometres of power line checked, the searcher-detection and scavenger-removal rate, the code of the wind turbines or power-line sections where mortality has occurred and the estimated fatality rate per installed MW of wind turbine and kilometre of power line.

   b) A résumé chapter summing up the results of all previous six-monthly reports. This information shall include not only all the variables mentioned in a) above but also tables and graphs giving an at-a-glance idea of the information presented. These will include a direct historical mortality table with the denomination of each wind turbine, its precise UTM coordinate, the victim species and observation date.

   c) Detailed description of the monitoring techniques and method, including at the least the dates it was carried out, ground-search techniques, search area and time, frequency and interval between checks, wind turbines and kilometres of power line checked per visit and the names of the people who carried out the work.

   d) Detailed description of the mortality monitoring protocols and techniques used for bats (ultrasound detectors, thermal-detecting cameras, frequency and interval, surveying effort, etc.).

   e) Description of techniques for monitoring alternative impact factors to those mentioned herein (e.g., nest-box monitoring, monitoring of specific species, road kill, etc.).

   f) Table showing the dead species found, the number of individuals, the observation date, the UTM coordinate and the specific death-producing wind turbine or infrastructure.

   g) A section detailing the trial to establish the searcher detection rate and the carcass removal rate. This will include at least the number and type of trial-carcasses used, the dates of the experiments, the frequency and interval of visiting carcasses and the mortality estimating formula.

   h) Table showing the number of individuals found dead and an estimate of dead individuals on the basis of the established searcher-detection and scavenger removal-rates, broken down in birds of large, medium and small size and bats.

7) These reports will be handed in regularly to the competent authority and will also be published on an official website to help coordinate future EMPs, reduce the impact of up-and-running and future wind farms and new products and serve as a benchmark for environmental monitoring organisations.

An account is now given below of the basic guidelines for standardised assessment of some of the effects of up-and-running wind farms on flying vertebrates. The protocol has been broken down by the main negative impacts, describing one or more working techniques for each one. A set of minimum data-taking variables is also put forward to be taken into account in all EMPs. Given the variability of wind-farm impacts, the guidelines given here are to be considered a minimum set, with new environmental factors and methodological modifications to be grafted thereon as necessary according to sound scientific and technical grounds.

Photo: Felipe González-SEO/BirdLife

ONSHORE ASSESSMENT METHODS

Collision and/or electrocution mortality

Most of the direct mortality of a wind farm can be put down to collisions with or electrocution from wind turbines, meteorological towers and power lines. This factor is known to be influenced by such variables as the particular biology of the species affected, their density and behaviour, weather conditions or even the design of the wind farm itself (See, for example, Drewit and Langston, 2006; Powlesland, 2009; NWCC, 2010). It is therefore necessary to compile trustworthy information to help identify the wind-farm mortality variables in the interests of detecting, for example, dangerous wind-turbine configurations and proceeding to modify or re-site them, even shutting down the farm if need be. Any EMP therefore has to include a thoroughgoing monitoring plan comparable at national level to assess this impact.

To this end some guidelines are put forward for direct monitoring of bird and bat mortality on up-and-running wind farms. The protocol has been broken down into onshore and offshore wind power and, within those major divisions, into each of the impact-causing wind-farm components (wind turbines, meteorological towers and power lines).

Wind turbines

Impact: Collisions of bats and birds against wind-turbine blades and towers.

Monitoring technique: Thoroughgoing ground search for carcasses or any remains of birds and bats around the structure, considered by expert assessment to be results of a collision. For this purpose a round or square area centred on the base of the wind-turbine is set up, within which ground searches are made at a low and constant speed by means of line transects or concentric transects parallel to each other (figure 9). The maximum distance between transects must be 5 metres. In the interests of uniform data-collection procedures, the same time should ideally be spent on each ground search (at least 20 minutes per wind turbine).

Considerations:

1. The sampling unit is the wind turbine.
2. The ground search area has to be at least 10% more than the rotor diameter and has to be adapted to the particular characteristics of the terrain and vegetation when they pose a significant hindrance to the search.
3. During the first three years all farm wind turbines should be checked at least every 15 days. In general, from the fourth year onwards, monthly ground searches around all turbines will be carried out in farms with fewer than 20 wind turbines; in farms with 20-40 wind turbines 50% will be checked every month and in farms with over 40 a selection will be made of 30% also to be checked monthly.
4. The ground searches have to be conducted by expert observers or people previously trained up for this task before starting the EMP. Carcass-detection trials over the terrain should be conducted using trial carcasses of various sizes and colours.
5. Searcher fatigue cuts down the carcass detection capacity, so no single searcher should search more than 10 wind turbines per day.
6. Any carcasses found outside the search periods should be recorded and considered separately.
7. It is recommendable to find out the background fatality rate of the study zone before starting the EMP; this rate should then be deducted from the final observed fatality rate. To find out this background fatality rate ground searches should be made in the immediate vicinity of the monitored wind turbines but outside their zone of influence (~500 m). These searches will be carried out in the same habitat as that which exists in the wind farm and using the techniques described herein.

Photo: J. C. Atienza-SEO/BirdLife

SEO/BirdLife volunteers checking a wind farm.

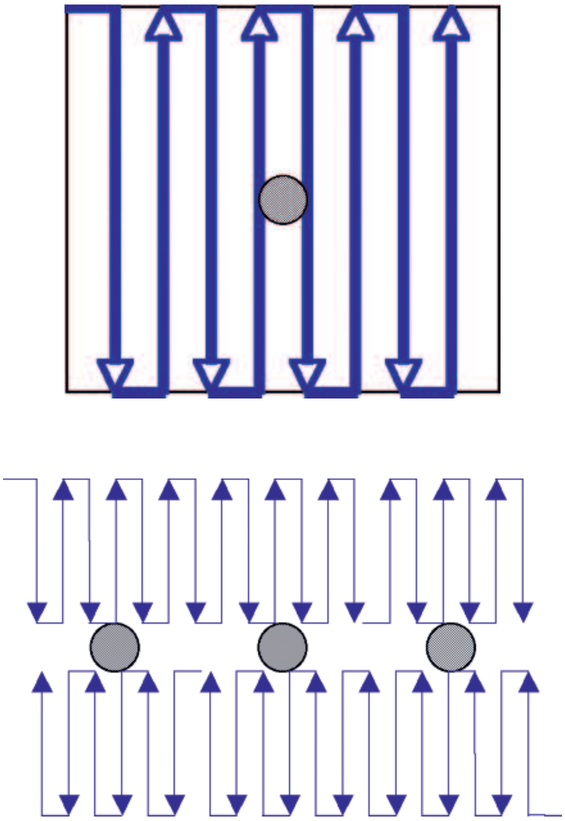


Figure 9. *Ground search schemes by means of line transects. The shaded-in circles represent the wind turbines and the blue arrows show the searcher's path. The lower diagram shows a ground search example around a unit made up by three wind turbines.*

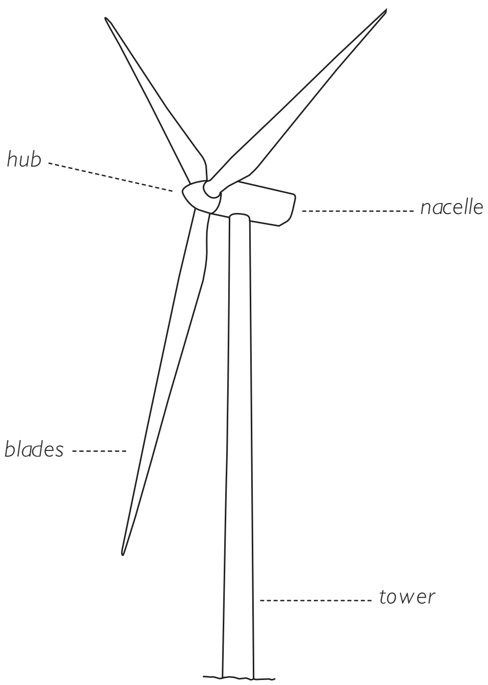


Figure 10. *Wind turbine with its basic parts: tower, blades, rotor and nacelle.*

Overhead grid-access power line

Impact: bird collision against the cables and pylons and electrocution from contact with infrastructure components.

Monitoring technique: Thoroughgoing ground search for carcasses or any remains of birds around the structure, considered to be the result of collision or electrocution. The ground searches will be made by means of zig-zag transects under the overhead line walking at constant speed and taking in a 25-metre swathe each side on both outward and return legs (figure 11). During the search special attention will be paid to lattice pylons.

Considerations:

1. The sampling unit is defined by the kilometres of line searched.
2. The power line should be checked along its whole length at least once a month during the first two years. For very long power lines the carcass search can be broken down into 5km sections that will be systematically checked until completing the whole line. After the third year the search frequency can be adapted to observed impact characteristics, scaling the monitoring effort up or down accordingly. When it is decided to scale down the searches they will then be distributed evenly throughout the year. When there is trustworthy and sufficient information to go on, the searches can be arranged to concentrate on important seasonal movements (e.g., breeding and wintering), known mortality peaks, especially hazardous sections, important flocking movements or areas habitually frequented by sensitive species (e.g., great bustards and little bustards). The monitoring effort has to be shared out evenly and in a standardised way throughout the whole year.
3. The search route can be adapted to suit the characteristics of the terrain and vegetation when these represent a considerable hindrance to the search.
4. Searcher fatigue cuts down the collision and electrocution detection capacity, so no single searcher should search more than 5 km of line per day.
5. Any carcasses found outside the search periods should be recorded and considered separately.
6. It is recommendable to find out the background fatality rate of the study zone before starting the EMP; this rate should then be deducted from the final observed fatality rate. To find out this background fatality rate ground searches should be made in the immediate vicinity of the monitored power line but outside its

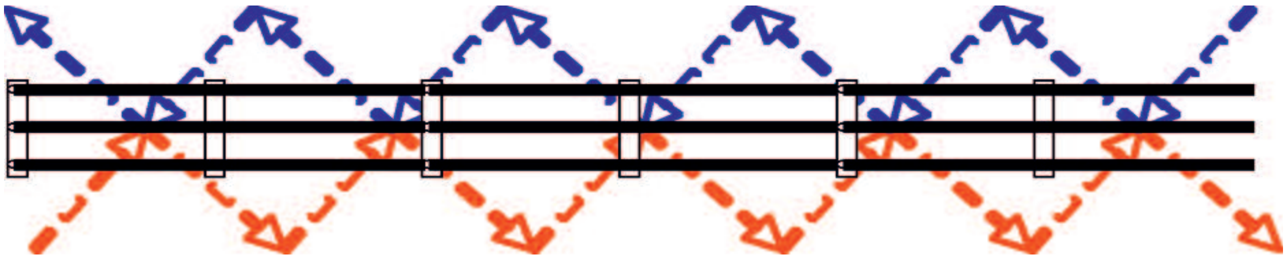


Figure 11. *Zig-zag two-leg power line search scheme*

zone of influence (~500 m). These searches will be carried out in the same habitat as that which exists along the line route and using the techniques described herein.

Meteorological towers

Impact: collision with bracing cables and the mast itself.

Monitoring technique: the search method is the same as the one described for wind turbines but the search area is delimited by the area occupied by any bracing cables or a 10-metre radius if there are no such cables. The searches can be carried out at the same time as the wind-turbine searches but must be dealt with separately.

Incident Recording

After finding carcasses or remains associated with the wind-farm infrastructure, a series of variables should then be recorded to define the causes and species affected. There follows an account of the most basic variables that have to be included in all EMP incident recording (See also field recording sheet 1 Annex 4).

- Name of the wind farm
- Province and municipal district
- Observation date (day/month/year)
- Searcher's name and contact details
- Infrastructure responsible for the impact (wind turbine, power line, meteorological tower, others (indicate which))
- UTM coordinates and reference datum
- Found during routine ground search: Yes/No
- Scientific name of the species
- Sex of the victim
- Age of the victim: fledgling, juvenile/subadult, indeterminate
- Approximate time of death: <12 hours, <24 hours, 2 days, 3 days, etc.
- Carcass state: recent, partially decomposed, bones and remains, depredated.
- General description of the habitat in a 50-m radius.
- Photograph of carcass/remains.

Adjustment factors to allow for search-efficiency and scavenger-removal skews

Actual wind-farm mortality is always higher than the observed rate since there is never complete detection of all deaths caused by the wind-farm infrastructure. The main factors affecting mortality calculations are vegetation cover, searcher-detection capacity, frequency and interval between searches, the casualty species of bats and birds, seasons, the abundance and type of predators and scavengers in the study zone or the non-detection of birds falling outside the search zone or scurrying off injured to die elsewhere (crippling bias) (Bevanger, 1999; Erritzoe *et al*., 2003, Smallwood, 2007, Smallwood and Thelander, 2008). Some research has even suggested that final estimated fatality rates, even allowing for searcher-detection and scavenger-removal skew corrections, could differ from actual mortality by a factor of up to 40 (Smallwood, 2007). It is therefore vital to obtain and apply robust adjustment factors that minimise this bias as far as possible and bring estimates as close as possible to the actual fatality rate (Anderson *et al*., 1999; CEC and CDFG, 2007, Smallwood, 2007).

Carcass removal rate

Carcasses tend to disappear naturally in nature due to elimination by scavengers or weathering. The removal rate depends basically on several factors:

1) The size of the carcass. Small carcasses tend to disappear sooner than big ones.
2) Natural depredation, determined by scavenger density.
3) The animal group. Bats disappear quicker than birds.

4) The time of year. In the USA, for example, there is heavier depredation of carcasses during the autumn than during the winter, due to the predators' need of building up fat deposits for the winter (Smallwood, 2007). Some species are part-time scavengers, seeking other sources of food at other times of year. Weather conditions, moreover, often mean that smaller carcasses disappear more quickly or are more easily detectable by scavengers.

It is therefore necessary to run trials to find out the carcass removal rate in each of the wind farms analysed, during the most significant periods and throughout the years of environmental monitoring.

This trial will involve the use of at least 100 bird carcasses and 20 field-mouse carcasses in the immediate vicinity of the wind farm, in due proportion to the types of habitat present. The trial carcasses will be fresh carcasses divided up by size.

The following criteria need to be met to ensure that carcass-removal trials provide trustworthy results:

1) The trial carcasses have to be placed in all types of habitat present around the wind farm and in due proportion to the area they occupy.
2) Likewise they should be placed at different distances from the base of the wind turbine and in various dispositions. They should therefore be thrown down so that their final disposition is more or less random (near bushes or trees, in grassy areas, face up, face down, etc.).
3) Trial carcasses will be placed proportionately to the number of wind turbines or by phases to avoid a glut of carcasses around the same wind turbine or power line.
4) It is crucial to mark the exact placement point by GPS, record the type of carcass used and give a description of the place to be able to find it later.
5) Depositing 120 carcasses all at once would overload the site with carrion and skew the carcass removal results. The experiments should therefore be conducted in four different periods, depositing 30 carcasses each time.
6) After placement, the carcasses are checked five days on the trot and then every other day until building up the number of days equal to the sampling frequency indicated in the EMP (i.e. 15 days if these guidelines are followed). The relation between the permanence of carcasses and frequency of checks will tell us the removal rate. Permanence of the trial carcass will be taken to be the continuing existence of sufficient remains to be detectable by the searcher.
7) If it is suspected that there may be some seasonal variability in the carcass removal rate, this sample procedure should then be repeated in the different seasons.

The results will be a removal rate by size of birds and mammals, understood for these purposes as undetected carcasses on the last day of checks for this category of trial carcasses.

Searcher Detection Rate

Although small transects are designed and only experienced observers carry out the searches, it is inevitable that all the carcasses in the study zone will not be found. The reasons for this skew in the carcass detection rate are basically the following (Smallwood 2007):

1) Vegetation cover and type in the search zone. If the area is covered, for example, by dense scrub or snow, detectability will be much lower than in more open areas. Likewise, low detection rates of small birds in low-vegetation zones could be a sign of high scavenger-removal rates.
2) The species of the carcass concerned. Detectability varies directly with species size. Furthermore, large raptors, for example, are much easier to find than large birds from other taxonomic groups.
3) The search radius, which might not take in carcasses thrown by the blades outside the standard search distance.
4) Searcher limitations. Not all human beings, for example, have the same acuteness of eyesight; fatigue might affect them differently too.
5) Meteorological factors or the lie of the land, which may affect the searcher's concentration powers.

Adjustment factors to allow for these skews therefore need to be applied, together with the scavenger-removal adjustment factors, to calculate the total mortality of any wind farm.

Searcher-detection adjustment factors are calculated from the ratio between the number of trial carcasses deployed and those actually found by searchers. These can be taken from the scavenger-removal-rate experiment providing that the number of carcasses deployed is over 20 and the fieldworker who found them is not the same as the one that placed them. If a trial is conducted solely to find out the searcher-detection rate, a fieldworker will place at least 20 carcasses of different sizes and states of conservation randomly around the wind turbines. The dummy carcasses may be obtained from road kill or carcasses found during wind farm monitoring. It is not recommendable to use fresh carcasses since searchers under real search conditions are more likely to find remains than fresh carcasses. A second fieldworker, unaware of the carcass placement sites and number of carcasses, will then search the wind-turbine area following the habitual search method. The person who placed the carcass will follow along behind the trial searcher to record whether or not the carcasses he/she placed are actually found by the searcher. The eventual ratio between carcasses deployed and carcasses found will tell us in each case the search-efficiency rate.

VARIABLES (Erickson *et al.*, 2004)

m	Average number of carcasses per wind turbine and period after adjustment of carcass counts to allow for scavenger-removal and searcher-efficiency skews.
$\bar{c}$	Average number of carcasses found per wind turbine and year
c_i	Number of carcasses found in the search unit per study period
□	Number of sampling units
$\hat{\pi}$	Estimate of the probability that the carcasses are present and found
k	Number of wind turbines searched
S	Number of carcasses used in the trials
S_c	Number of placed carcasses that remain after the X days that the trial lasts (see Considerations section)
$\bar{t}$	Average days that the trial carcasses remain before removal
t_i	Days that each trial carcass remains before removal
I	Average interval in days between search periods
p	Proportion of carcasses found by searchers in relation to total placement (as a percentage)

Table 7. *Definition of the variables used in the equations of Erickson* et al. *(2004).*

Estimate of real wind-farm mortality

An account is now given of two of the most commonly used mortality-adjustment formulae.

A. Erickson *et al.* (2004): This formula assumes that the ground searches are periodic and equidistant in time (Table 7).

So that the observed fatality rate ($\bar{c}$) is the average number of collisions per wind turbine and year:

$$\bar{c} = \frac{\sum_{i=1}^{n} c_i}{k}$$

Estimation of the carcass removal rate ($\bar{t}$), used to adjust the observed fatality rate, is defined as the average length of time a carcass remains at the site before it is removed:

$$\bar{t} = \frac{\sum_{i=1}^{s} t_i}{s - s_c}$$

Searcher efficiency (p) is expressed as the proportion between carcasses detected in the trial and those actually placed on the site.

Finally the equation giving us the fatality rate per wind turbine and year is:

$$m = \frac{\bar{c}}{\hat{\pi}}$$

where $\hat{\pi}$ represents adjustments for search efficiency and carcass removal rate skews on the assumption that the time to carcass removal (t_i) follows an exponential distribution. Working from these assumptions the detection probability would then be defined as:

$$\hat{\pi} = \frac{\bar{t} \cdot p}{I} \cdot \left[\frac{\exp(I/\bar{t}) - 1}{\exp(I/\bar{t}) - 1 + p} \right]$$

B. Shoenfeld (2004): This formula assumes that collisions, carcass removal and detection are all random processes following a Poisson distribution. It likewise considers that the search periods of the sampling units are also random. It is less precise than the formula of Erickson *et al.* (2004).

Thus the average mean fatality rate per wind turbine and period (m) is:

$$m = \frac{N \cdot (t \cdot p + I) \cdot C}{k \cdot t \cdot p}$$

where N is equal to the total number of turbines in the wind farm, I is the mean interval between searches in days, C is the total number of carcasses detected per study period, k is the number of turbines sampled, t is the mean carcass removal time in days, and p is the searcher efficiency rate.

Considerations:

1. It is recommended that, whenever possible, searches should be conducted in systematic periods with application of the equation of Erickson *et al*. (2004).
2. The carcass-removal and searcher-efficiency trials will be carried out at least once, in landscapes with few seasonal variations (e.g. period of maximum ecosystem activity), and at least twice a year in landscapes with marked seasonal changes (spring and winter). It is recommended that the adjustment factors should be recalculated every two years.
3. Removal rates are specific for each wind farm, so specific adjustment factors have to be calculated for each one.
4. Detection rates are specific for each searcher. In wind farms where several searchers are working, therefore, specific adjustment-factor trials have to be conducted for each one. Estimates of total wind farm fatality can then be based on the average detection rate of all searchers.
5. Excessive use of trial carcasses in short periods of time could produce an initial surge in the local presence of scavengers and a subsequent fall in their activity in the area, distorting the skew-correction factors. More detailed information on carcass detection conditions can be found in the work of Smallwood (2007).

Habitat Loss/Deterioration and Disturbance

These are impact factors deriving from the wind-farm construction and maintenance phases with common environmental consequences: reduction in the quality of species habitats.

Habitat loss or deterioration, produced by earth movements, scrub clearance, opening up of access paths and platforms of the wind turbines, involve significant impacts for birds, such as population reductions, enforced desertion, species impoverishment, isolation or increase in predation and parasitism rates. Disturbance, on the other hand, is caused by the presence of maintenance personnel and vehicles around the wind farm; its possible effects include enforced desertion, reduction in breeding success and species impoverishment.

Since both impacts involve a reduction in the number of species (richness) and the number of birds within those dwindling species (abundance), it is these effects that monitoring efforts should concentrate on. The assessment will be made by finding out the abundance and richness of small and medium-sized birds.

The techniques put forward here should be taken as a minimum protocol that aims to unify information-collection procedures. By their very nature these techniques can then be easily adapted to the particular circumstances and objectives of each wind farm. Where justified on technical grounds, however, they may be modified or replaced by others more suitable for the monitoring objective.

A. Fixed width line transects

This surveying method allows us to find out the density of individuals of nearly all the species present around the wind farm (see Bibby *et al*., 2000; Sutherland *et al*., 2004). It consists of a contact survey while walking steadily along a fixed route and noting down all birds seen or heard within a 25-metre band each side of the surveyor. Each contact-survey walking route is broken up into 500 m sections, thus covering a total area of 2.5 hectares. The routes are walked at a speed of 1-3 k.p.h early in the morning on days without strong wind or rainfall. Species detected within and outside the 25-metre band are noted down separately (see Field Recording Sheet 2, Annex 4).

Using the above procedure, species abundance (a) and richness (r) per area is expressed as:

$$\frac{n \cdot k}{L}$$

where n is the number of contacts of different species, k is the probability of detecting individuals and L is the surveying area (2.5 hectares).

B. Point Counts

Where it proves to be impossible to carry out distance-sampling line transects due to the lie of the land or the type of habitat, similar information can be obtained from point counts. This surveying technique also gives us an approximate idea of the number of individuals and species in a given area (see Bibby *et al.*, 2000; Sutherland *et al.*, 2004). It consists of noting down all species and number of individuals seen or heard within a 30-40 metre radius around the surveyor during a 5-10 minute wait. Counting points have to be at least 200 metres from each other and the counts are made early in the morning on days without strong wind or rainfall. All species falling inside and outside the 25-m radius are noted down plus those that fly off on surveyor approach (see Field Recording Sheet 3, Annex 4).

The equation determining the number of individuals (a) and species (r) in a point count is:

$$\frac{n \cdot k}{\pi \cdot r^2}$$

where n equals the number of contacts of different species, k is the probability of detecting individuals, π is 3.1416… and r is the radius of the contact circle (30 m).

There now follows a series of considerations about factors that should be taken into account when implementing either of these surveying techniques:

- Both surveying techniques are based on the assumption that all individuals are detected within the band (k = 1), that these do not move (birds in flight are not counted) and that each individual is counted only once.
- The line transects and counting points are set out along the wind-turbine line up and in a control zone (see below); they are shared out in due proportion to the habitat types present and should take in at least two moments of the year in both zones, preferably coinciding with important periods of seasonal activity (wintering and breeding).
- Whenever possible, between 10-20 line transect surveys and 20-40 point count surveys will be carried out per-wind farm zone and control zone. In the wind farm the line transect surveys and point count surveys will be arranged along the paths of the wind turbines and, in the control zone, cross country or on little-frequented paths and tracks.
- In certain circumstances it may be useful to broaden the contact bands for both line transects and point counts (e.g. 25-50-75 metres); in this case it would be recommendable to use the Distance programme for data analysis (http://www.ruwpa.st-and.ac.uk/distance/).
- Line transects are better for large wind farms with several kilometres of wind turbines, while count points might be better for smaller wind farms where there are not enough kilometres of paths or wind turbines for carrying out the transects.
- Further information on bird surveying techniques can be obtained from Ralph *et al.* (1995), Bibby *et al.* (2000) and Sutherland *et al.* (2004).

Control Zone

The control zone is selected previously in an area with similar vegetation and lie of the land to the wind farm site and situated at least 500 m from the wind turbines. Within this selected control zone line transects or point counts are set up as described in the respective sections above. Comparison between the results (wind farm and control zone) will tell us whether any observed changes in the trends and makeup of bird populations are due to the presence of the wind farm or are natural processes. This will isolate the effect of the wind-farm infrastructure.

Photo: Niko López

Abundance and Use of Space by Key Species

- ***Abundance***

  For some species the above-mentioned methodology is not appropriate, either because they are rare, range over a large area, have cryptic plumage or are sulking in nature. Others may merit special attention due to their state of conservation. In all such cases a specific monitoring procedure should be used to find out their abundance. In the interests of consistent results at national level, the protocols proposed for the SEO/BirdLife-brokered national counts will be followed, where available for the species concerned. These single species procedures can be downloaded in PDF format from: http://www.seo.org/trabajamos-en/estudio-de-especies/

- ***Use of Space: Kernel Polygons***

  The technique described here aims to give an approximate idea of the most intensive flying zones of species most sensitive to wind-farm impacts (mainly raptors and other large soaring birds) in the vicinity of the wind turbines and the grid-access power line. It should be considered as a complement to the information obtained from the environmental impact assessment report rather than a substitute, since the EIA should always contain sufficient information for decision-making on this matter during the EMP.

  The first step in determining the degree of use of the wind-farm area is to find out the frequency with which each species is actually observed in controlled time- and area-units. This information will be obtained from fixed lookout points. These will be sited on high ground (identified from maps and previous visits) giving an unobstructed view of the whole wind-farm area. The distance between the lookout point and the zone to be monitored should not exceed 2 km if binoculars are being used or 3 km if telescopes are being used. The sum of the areas taken in by each lookout point should encompass the whole wind farm or power line without any overlaps between them.

  Each lookout point should be visited at least 4 times a month with at least one-and-a-half hour stays each time. The watch periods should start at about 08:30-10:00 ending by about 12:00-13:30. Afternoon watches should preferably be avoided, because these species tend to be less active at that time, but if it is chosen to do so they should be restricted to the time bracket 17:30 to 19:30. The watches should be made during clear, dry weather, although the moments just before a storm or after rain are especially favourable (many species return to the nesting area just before a storm or leave it when the rain stops).

  Each contact is noted down, recording the area where the bird spends most of its time during the sighting, calculating its position visually and projecting it vertically onto a topographic map before later transference to digital cartography. Free GIS tools such as HawthsTools (SpatialEcology.com) can be used for making fixed kernel probabilistic estimates of contact density per species (see figure 12). For information processing purposes the contacts should be broken down by species and study periods (for example periods of particular seasonal behaviour) and the sampling effort has to be the same at each lookout point and seasonal moment into which the monitoring is divided.

The following variables will be noted down at each lookout point (see Field Recording Sheet 4, Annex 4):

1. Date and place of observation, UTM coordinates of the lookout point, mapping of the approximate sampling area, types of habitat within the controlled area, windspeed (Beaufort scale), percentage cloud cover, observation start and end time.
2. Number of individuals seen or heard in 10 minute watch periods until building up to one and a half hours. Nine values are obtained including zeros. If the same bird is seen in different 10-minute periods, it is

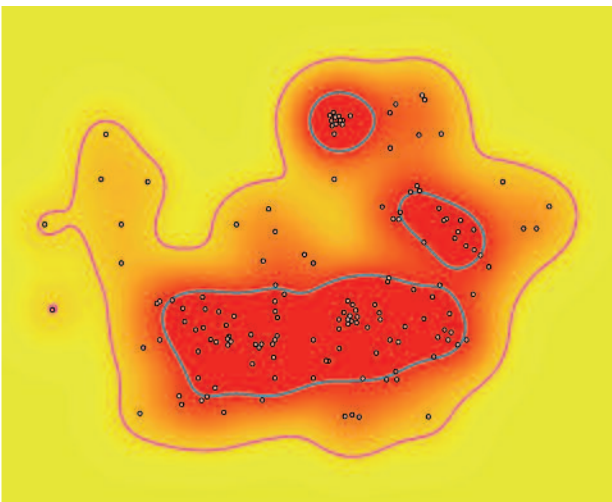


Figure 12. *Example of mapping of contacts and kernel-function calculation of the area of frequent use.*

noted down independently each time. Contacts are mapped or shown on an orthophoto.

3. For each contact a note is made of a minimum set of variables for determining the movements in the wind-farm zone and estimating the minimum number of territories (Field Recording Sheet 5, Annex 4):
   - Code of each contact on the topographic map for subsequent identification.
   - Species recorded.
   - Flying height.
   - Flight direction: N, S, E, W, NW, SE, etc.
   - Geographical feature where the bird was seen or heard: plain, riverside cliff, mountain pass, valley, river, hillside, etc.
   - UTM coordinate where the bird spent most of the time.
   - Any other information of interest for the EMP (nesting, roosts, etc.).

OFFSHORE ASSESSMENT METHODS

SEO/BirdLife has participated in an ambitious transnational cooperation project working for the protection of the Atlantic Marine Environment, known as FAME (Future of the Atlantic Marine Environment). Its strategic objectives include assessment of the impact of human activities (including offshore renewable energy initiatives) on important bird sites. Under the aegis of this project a specific report has been drawn up on the impact of offshore wind power on birds (Batemann Posse, 2011). An account is now given of some of this report's specific indices for assessing the impact of marine wind farms (MWF) on bird populations. These can then be used for environmental impact assessments during the pre- and post-construction phases.

These indices help to estimate the degree of sensitivity and identify the bird populations that could be affected by MWFs. Their use together with remote detection techniques will facilitate correct MWF-planning and -construction in the future.

Estimating the risk and number of collisions

Desholm *et al*. (2006) have developed a model for estimating collision risk (R) for species of migratory birds. This is defined as the proportion of birds/flocks (P_i) exposing themselves to MWF collision, assessed at four risk levels (r_i): Level 1 relates to the study area; level 2 the wind farm; level 3 the horizontal reach of the rotor-blades, and level 4 the vertical reach of the rotor-blades. The value of r_i can be measured directly during the pre-construction phase by multiplying the pre-construction proportion of birds/flocks (p_i) passing the level-specific conflict window with the assumed (published estimates) proportion of birds (a_i) not showing any evasive manoeuvres at the given level or as the transition probability distribution for the post-construction phase. After level 4, a factor describing the by-chance-probability (c) of not colliding with the rotor-blades must be added to account for those birds safely passing the area swept by the rotor-blades, either by chance or because they carried out evasion manoeuvres. An overall collision risk (R) can be obtained by multiplying the four probability risk values:

$$R - r_1 \times r_2 \times r_3 \times (r_4 \times (1 - c))$$

[1]

Estimating the total number of collisions or the number of birds ($e{\downarrow}i$) that avoid coming into contact at any risk level involves finding out the total number of birds/flocks (n_i) that are passing through at migration times, bearing in mind the collision risk they are exposed to (r_i). Data should be culled by way of remote detection methods (radar and TADS) and direct sightings in the interests of the best possible precision. The following factors have to be borne in mind for each risk level:

- Level 1: n_1 represents the overall number of birds/flocks passing through the study area.
- Level 2: n_2 is the number of birds passing the MWF. It is obtained from the product of $n_1 \times r_1$ (proportion of birds/flocks exposed to the risk of contact with the MWF).
- Level 3: n_3 is the number of birds /flocks that pass within the horizontal risk distance. It is the product of $n_2 \times r_2$ (proportion of birds/flocks that are exposed to the risk of passing within the horizontal reach of the rotor blades). Radar data defines the distance to the nearest turbine.
- Level 4: n_4 (number of birds/flocks flying within the vertical reach of rotor-blades) is the product of $n_3 \times r_3$. This level has to include the parameters of the birds that collide with $(r_4 \times (1 - c))$ or successfully evade the rotor blades $(e_4 + (r_4 \times c))$. The number of birds/flocks entering the vertical reach of the rotor

blades is estimated from the approach height distribution. Depending on the detection system used, this information can be obtained from vertical radar or the TADS height data collection protocol (see Desholm *et al.*, 2005).

The final product will be the prediction of the number of birds colliding with or avoiding the MWF wind turbines:

$$n_{collisions} - n_4 \times r_4 \times (1 - c)) \quad [2]$$

$$n_{collisions} - (n_4 \times r_4 \times c) + \sum (n\downarrow(i) \times e\downarrow i) \quad [3]$$

The main advantages of this method are the following: it can be implemented in different scenarios (e.g. at day or night, with head-wind or tail-wind and in any part of the wind turbine); it allows for a more precise estimate of the total number of collisions and quantifies the various species' MWF collision avoidance capacity. Once again, it should be backed up by remote detection technology to obtain more specific data and estimate model parameters.

Vulnerability Index

Garthe & Hüppop (2004) used nine different variables based on seabirds' specific attributes to draw up a species sensitivity index (SSI) for assessing collision risk with the turbines or an MWF's degree of disturbance:

a) flight manoeuvrability,
b) flight altitude,
c) percentage of time flying,
d) nocturnal flight activity,
e) sensitivity to disturbance by ship and helicopter traffic,
f) flexibility in habitat use,
g) population size,
h) adult survival rate and
i) European threat and conservation status.

Five of these factors could be obtained from data taken in the field (b, c, g, h and i) while four could be obtained only subjectively (a, d, e and f) (depending on the researcher's degree of experience). Each factor was scored on a 5-point scale from 1 (low vulnerability of seabirds) to 5 (high vulnerability of seabirds).

Once quantified these factors then have to be pooled in three groups for calculation of the species sensitivity index: flight behaviour (factors a-d), general behaviour (factors e-f) and population status (factors g-i). For each group, an average score of the respective factors is calculated and multiplied by the scores of the other groups, according to the following expression:

$$\text{SSI} = \frac{(a + b + c + d)}{4} \times \frac{(e + f)}{2} \times \frac{g + h + i}{3} \quad [4]$$

Once the species sensitivity index has been calculated for each species, the next step is then to draw up vulnerability maps. Garthe & Hüppop (2004) quantified bird density (grid size of 120 km^2 and 300-metre bandwidth transects) in each season of the year. Density per grid cell was obtained by dividing the sum of individuals recorded in the transect by the total transect area covered by study cruises. The SSI for each species is multiplied by In (density +1) and added up for all species. Total vulnerability (wind-farm sensitivity index: WSI) is thus calculated from the following expression:

$$\text{WSI} = (\text{species } (In\ density\ (species + 1) \times \times\ SSI\ species) \quad [5]$$

According to the authors there are four main reasons for application of species sensitivity indices (SSI) and vulnerability indices (WSI) in MWF environmental impact studies. (i) sensitivity differs substantially from one species to another. This is very important in view of the fact that four variables are obtained subjectively, based on at-sea experience. By combining abundance data with evaluations of the sensitivity of each species, a calculation can then be made of total vulnerability in the area; (ii) few alterations are required on the basis of the evaluations made by national and international experts, suggesting that the species-specific scores for each vulnerability factor are well chosen; (iii) even when minor score differences do occur, they do not affect the SSI much; finally, (iv) spatial representation of the WSI values fits in well with previous evaluations of the location of important bird areas.

Demographic Sensitivity Index

Assessment of the cumulative impacts on populations of migratory birds flying through any wind farm calls for a previous population level assessment (Desholm, 2006), since the number of victims will depend on the population size and the species' life histories (Fox *et al.*, 2006).

Desholm (2009) developed a general framework for environmental assessments, prioritising key species known to be particularly sensitive to bird-wind turbine mortality.

The combination of indicators like abundance and demographic sensitivity is the central thrust of this study. This enables migratory bird species to be broken down by collision proneness into the following two groups:

i) a relatively high number of individuals exposed to various risk levels, and
ii) demographically sensitive to adult mortality.

This then enables us to identify the most sensitive migratory bird species at different MWFs over a very broad geographical region. It is also still valid when the information to hand is meagre, for example when there is knowledge only of the approximate number of birds passing through a specific area. The final result of the use of these indicators is a practical species sensitivity index, avoiding dependence on arbitrary weightings of several incompatible and correlated factors.

Relative Abundance

Relative abundance (RA) is defined as:

$$RA = \frac{\alpha}{\beta} \times 100\% \qquad [6]$$

where α is the number of birds flying over a given risk level (e.g., the study area, the MWF or the collision zone, depending on the level of information to hand) and β is the total number of birds in the geographical reference population, defined as the number of birds flying through the wind-farm area and occupying the breeding areas closest thereto. Information to hand on migratory birds might be too limited for a study of relative abundance in the proposed MWF. Nonetheless, migration counts and local ringing days could furnish a list of the species and number of birds passing through the study area, favouring the establishment of priority species.

This significant advantage of this indicator over others is that it can define the geographical sub-population likely to be affected by any type of wind farm (Desholm, 2009).

Demographic Sensitivity

This indicator measures elasticity of population growth rate(λ) to changes in adult survival ($s{\downarrow}(2)$) of each species (Beton & Grant, 1999; Caswell, 2001; Desholm, 2009). To put it in a nutshell, this indicator takes into account additional changes in the mean adult survival rate as a result of wind turbine collisions.

The specific elasticity of each species is estimated using Leslie's classification matrices, applying theoretical survival and fecundity values of adults ($s{\downarrow}2,\ f{\downarrow}2$) and juveniles ($s{\downarrow}1,\ f{\downarrow}1$). The matrices were based on demographic parameters of females on the basis of pre-reproductive counts with a projection interval of one year and on the assumption of a balanced gender proportion.

$$Ai = \begin{bmatrix} f1 & s1 \\ f2 & s2 \end{bmatrix} \qquad [7]$$

The fecundity of non-breeding females is zero by default and s_1 is allocated the value of $\lambda = 1$ since it does not affect the distribution of species elasticity. The models have to be implemented with different combinations of f_2 (1-5) and of s_2 (0.1-0.9). A regression analysis is carried out for each adult fecundity value, involving adult survival elasticity and determining the equation and coefficient of determination (r_2). Matrix based modelling of this type, widespread and fairly simple, comes in very useful for the first wind-farm environmental impact assessments.

Migratory bird species have to be broken down into high and low segments for both indicators, using arbitrary thresholds. The relative abundance indicator threshold is set at 1%, which is the same threshold used by the Ramsar convention for international characterisation of areas sustaining 1% of the birds' bio-geographical population. For the elasticity indicator the threshold is set at 0.33, at which value the species growth rate begins to be most sensitive to changes in the adult survival rate. This is due to the following reasons:

i) that the sum of the elasticity values of each class is equal to one,
ii) but since the juvenile elasticity value (e_{f1}) equals zero,
iii) the population will be more sensitive to changes in adult elasticity (e_{f2}).

Three priority levels are then applied to these species indicators:

1) "high priority species" are those showing high values in the two indicators,
2) "medium priority species" are those showing one high and one low indicator and
3) "low priority species" show low values in both indicators.

Species also have to be broken down into the following groups:

1) seabirds or waterbirds,
2) raptors and
3) passerines.

The advantages of these indicators for environmental impact assessments are the following:

i) they describe the known characteristics of population dynamics and relative abundance of the species within the migration or study area;
ii) they cater for all possible levels of information, ranging from a mere list of species up to a knowledge of the number of birds and which species fly within reach of the turbines;
iii) the implementation of two independent variables reduces the time-consuming selection of several factors for drawing up an index and finally
iv) decisions can be taken on the basis of the most objective information possible.

Photo: Cristina Sánchez

Offshore Wind Farm in Denmark.

Photo: Cristina Sánchez-SEO/BirdLife

ACKNOWLEDGEMENTS

V1.0 of this guide drew on the research of Isabel Martín Fierro as part of her MSc in environmental administration and management from the *Fundación Biodiversidad*. Crucial knowledge and expertise was also gleaned from participation in the European Commission's working group for drawing up the document "Guidelines. Wind Energy Development, and EU Nature Conservation Requirements" and in the meeting called by CONABIO, SEMARNAT and Pronatura (BirdLife in México) in Mexico City in April 2008 for fine-tuning definitions of some methodological aspects of the guide. The check of the EIA reports presented in Extremadura was made as part of the programme *Alzando el Vuelo* and the bat data was furnished by SECEMU. Review of the environmental monitoring plans was carried out with the collaboration of Juan López Jamar, Cristobal Martínez Iniesta and Alberto Martínez Fernández. Albert Cama collaborated in checking the texts on offshore wind power.

The *Ministerio de Medio ambiente y Medio rural y Marino* granted a subsidy for writing and publishing hard copy versions 1 and 2, and *Fundación Biodiversidad* for the design and printing version 3. Versions 2 and 3 have been enriched from the contributions made in the online forum (http://eolicas.foroactivo.net); our special gratitude here goes to Xavier Parellada, Joaquín Grijota Chousa and Álvaro Camiña. Version 4 is a translation of version 3, from Spanish into English, that was undertaken thanks to the generous support of the MAVA Foundation.

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ANNEX I

Bird collision mortality at wind facilities

Group	Species	Location	Country	No. Of Carcasses	Reference
MAR	*Gavia stellata*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
MAR	*Pelecanus occidentalis*	Puerto de Altamont	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
MAR	*Uria aalge*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Aechmophorus occidentalis*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
ACU	*Aechmophorus occidentalis*	Foote Creek Rim	USA	1	Johnson *et al*., 2001.
ACU	*Aix sponsa*	Mountaineer	USA	1	Kerns et Kerlinger, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas crecca*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas discors*	Castle River (Alberta)	Canada	1	Brown, comm. Pers. En: Kingsley y Whittam, 2007.
ACU	*Anas discors*	Buffalo Ridge	USA	1	Johnson *et al*., 2002.
ACU	*Anas platyrhynchos*	Niedersachsen	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Sachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Schleswig-Holstein	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2004.
ACU	*Anas platyrhynchos*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
ACU	*Anas platyrhynchos*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2005.
ACU	*Anas platyrhynchos*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
ACU	*Anas platyrhynchos*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2005.
ACU	*Anas platyrhynchos*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
ACU	*Anas platyrhynchos*	canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2002.
ACU	*Anas platyrhynchos*	canal Boudewijn, Bruges	Netherlands	8	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Escaut	Netherlands	2	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Buffalo Ridge	USA	2	Johnson *et al*., 2002.
ACU	*Anas platyrhynchos*	Montezuma Hills	USA	2	Howell et Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Puerto de Altamont	USA	35	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Puerto de Altamont	USA	1	Thelander et Rugge, 2000. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Puerto de Altamont	USA	5	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	San Gorgonio	USA	3	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Stateline (Oregon)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Wisconsin	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Kreekrak (Pays-Bas)	USA	4	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
ACU	*Anas platyrhynchos*	Cádiz	Spain	2	Muñoz, 2008h
ACU	*Anas platyrhynchos*	Cádiz	Spain	1	Muñoz, 2008o
ACU	*Anas strepera*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anas strepera*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
ACU	*Anser anser*	Álava	Spain	1	Onrubia *et al*., 2003.
ACU	*Anser anser*	Elgea-Urkilla	Spain	1	Consultora de Recursos naturales, S.L., 2006.
ACU	*Anser anser*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2006
ACU	*Anser fabalis*	Sachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Anser fabalis*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Ardea cinerea*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
ACU	*Ardea herodias*	Nine Canyon (Wyoming)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
ACU	*Ardea herodias*	Stateline (Washington)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
ACU	Ardeida sin identificar	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	Aves acuáticas no identificadas	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
ACU	Aves acuáticas no identificadas	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
ACU	*Aythya collaris*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
ACU	*Aythya fuligula*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Aythya valisineria*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
ACU	*Branta bernicla*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
ACU	*Branta canadensis*	Klondike (Oregon)	USA	2	Johnson *et al*., 2003.
ACU	*Branta leucopsis*	Schleswig-Holstein	Germany	6	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Bubulcus ibis*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
ACU	*Bucephala albeola*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
ACU	*Bulbulcus ibis*	Cádiz	Spain	1	Lobón y Villar, 2009a.
ACU	*Bulbulcus ibis*	Cádiz	Spain	1	Muñoz, 2008b.
ACU	*Bulbulcus ibis*	Cádiz	Spain	1	Lobón y Villar, 2009b.
ACU	*Bulbulcus ibis*	Cádiz	Spain	2	Muñoz, 2008d.
ACU	*Bulbulcus ibis*	Cádiz	Spain	5	Muñoz *et al*. 2009
ACU	*Bulbulcus ibis*	Cádiz	Spain	2	Muñoz, 2008j.
ACU	*Bulbulcus ibis*	Cádiz	Spain	2	Muñoz, 2008l.
ACU	*Bulbulcus ibis*	Cádiz	Spain	4	Muñoz, 2008n.
ACU	*Bulbulcus ibis*	Cádiz	Spain	3	Muñoz, 2008o.
ACU	*Bulbulcus ibis*	Cádiz	Spain	2	Muñoz, 2008p.
ACU	*Bulbulcus ibis*	Cádiz	Spain	4	Fernández, 2008b.
ACU	*Bulbulcus ibis*	Cádiz	Spain	3	Fernández, 2008b 2009b.
ACU	Cercetas sp.	Kreekrak, Pays-Bas	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.

ACU	Cercetas sp.	Ponnequin (Colorado)	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
ACU	Cercetas sp.	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	*Ciconia ciconia*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Ciconia ciconia*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Ciconia ciconia*	Mecklenburg-Vorpommern	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Ciconia ciconia*	Sachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Ciconia ciconia*	Cádiz	Spain	1	Muñoz, 2008d.
ACU	*Ciconia ciconia*	Cádiz	Spain	3	Muñoz, 2008h.
ACU	*Ciconia ciconia*	Cádiz	Spain	1	Muñoz, 2008m.
ACU	*Ciconia ciconia*	Cádiz	Spain	1	Muñoz, 2008o
ACU	*Ciconia ciconia*	Cádiz	Spain	3	Clemente, 2009a
ACU	*Ciconia ciconia*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
ACU	*Ciconia nigra*	Hessen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Ciconia nigra*	Hessen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Cygnus cygnus*	Schleswig-Holstein	Germany	1	Durr, 2004 . En: Kingsley y Whittam, 2007.
ACU	*Cygnus olor*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Cygnus olor*	Niedersachsen	Germany	5	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Cygnus olor*	Sachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Cygnus olor*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
ACU	*Egretta garzetta*	Cádiz	Spain	1	Muñoz *et al*. 2009
ACU	*Egretta garzetta*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental, 2008. Parque eólico Montejo
ACU	*Fulica americana*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
ACU	*Fulica americana*	rivière Castle (Alberta)	Canada	1	Brown, comm. pers. . En: Kingsley y Whittam, 2007.
ACU	*Fulica americana*	Buffalo Ridge	USA	2	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
ACU	*Fulica americana*	San Gorgonio	USA	8	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	*Fulica atra*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2002.
ACU	*Fulica atra*	Canal Boudewijn, Bruges	Netherlands	6	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
ACU	*Fulica atra*	Kreekrak (Pays-Bas)	Netherlands	possibly 2	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
ACU	*Fulica atra*	Albacete	Spain	1	González, 2006c
ACU	*Gallinula chloropus*	Albacete	Spain	2	Cañizares, 2003.
ACU	*Gallinula chloropus*	Albacete	Spain	1	Martínez-Acacio, 2005a.
ACU	*Gallinula chloropus*	Albacete	Spain	1	Cañizares y Torralba, 2004
ACU	*Gallinula chloropus*	Albacete	Spain	2	Cañizares, 2006
ACU	*Gallinula chloropus*	Albacete	Spain	1	Gónzalez y Lozano, 2004
ACU	*Gallinula chloropus*	Albacete	Spain	1	Lozano, 2006
ACU	Ganso doméstico	canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
ACU	*Nycticorax nycticorax*	Pickering (Ontario)	Canada	1	James, 2003. En: Kingsley y Whittam, 2007.
ACU	*Nycticorax nycticorax*	Puerto de Altamont	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
ACU	*Nycticorax nycticorax*	Puerto de Altamont	USA	2	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
ACU	*Phalacrocorax auritus*	Puerto de Altamont	USA	1	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
ACU	*Phalacrocorax carbo*	Niedersachsen	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007
ACU	*Phalacrocorax carbo*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a
ACU	*Phalacrocorax carbo*	Albacete	Spain	1	Capilla Folgado *et al*., 2006b
ACU	*Podiceps nigricollis*	McBride Lake (Alberta)	Canada	1	Brown et Hamilton, 2004 . En: Kingsley y Whittam, 2007.
ACU	*Podilymbus podiceps*	Buffalo Ridge	USA	2	Johnson *et al*., 2002.
ACU	*Podilymbus podiceps*	Buffalo Ridge	USA	1	Strickland *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	*Porzana carolina*	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	*Porzana porzana*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R. 2006.
ACU	*Rallus acuaticus*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R. 2006.
ACU	*Rallus acuaticus*	Albacete	Spain	1	Vázquez, 2004
ACU	Somormujo sp.	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
ACU	*Tadorna tadorna*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Accipiter gentilis*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Accipiter gentilis*	Cádiz	Spain	1	Muñoz, 2008a.
RAP	*Accipiter gentilis*	Cádiz	Spain	1	Muñoz, 2008n.
RAP	*Accipiter gentilis*	Cádiz	Spain	1	Fernández, 2008b.
RAP	*Accipiter gentilis*	Cádiz	Spain	1	Ornitour, 2008a.
RAP	*Accipiter nisus*	Izco	Spain	1	Lekuona, 2001.
RAP	*Accipiter nisus*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2002.
RAP	*Aegypius monachus*	Soria	Spain	1	ENDUSA, 2006.
RAP	*Aegypius monachus*	Aragón	Spain	1	Faci *et al*., 2003
RAP	Águilas sin identificar	Puerto de Altamont	USA	38	Anderson y Este, 1988. En: Kingsley y Whittam, 2007.
RAP	*Aquila chrysaetos*	Izco	Spain	1	Lekuona, 2001.
RAP	*Aquila chrysaetos*	Navarra	Spain	1	Lekuona, 2001.
RAP	*Aquila chrysaetos*	Soria	Spain	1	CETASA, 2006c.
RAP	*Aquila chrysaetos*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
RAP	*Aquila chrysaetos*	Puerto de Altamont	USA	4	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
RAP	*Aquila chrysaetos*	Puerto de Altamont	USA	52	California Energy Commission, 2002.
RAP	*Aquila chrysaetos*	Puerto de Altamont	USA	30	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Aquila chrysaetos*	Puerto de Altamont	USA	54	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Aquila chrysaetos*	Puerto de Solano	USA	1	California Energy Commission, 2002.
RAP	*Aquila chrysaetos*	Albacete	Spain	1	Martínez-Acacio, 2003
RAP	*Aquila chrysaetos*	Albacete	Spain	1	Cañizares, 2006
RAP	*Aquila chrysaetos*	Burgos	Spain	1	
RAP	*Aquila chrysaetos*	Albacete	Spain	1	Vázquez, 2005
RAP	*Aquila chrysaetos*	Aragón	Spain	1	Faci *et al*., 2005
RAP	*Buteo buteo*	Brandenburg	Germany	11	Durr, 2004. En: Kingsley y Whittam, 2007.

RAP	*Buteo buteo*	Hessen, BW	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo buteo*	Niedersachsen	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo buteo*	Nordrhein-Westfalen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo buteo*	Sachsen-Anhalt	Germany	5	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo buteo*	Thüringen	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo buteo*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
RAP	*Buteo buteo*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
RAP	*Buteo buteo*	Cádiz	Spain	1	Lobón y Villar, 2009a
RAP	*Buteo buteo*	Cádiz	Spain	1	Lobón y Villar, 2009b
RAP	*Buteo buteo*	Cádiz	Spain	2	Muñoz, 2008e
RAP	*Buteo buteo*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a
RAP	*Buteo buteo*	Guadalajara	Spain	2	Ruiz, 2008a
RAP	*Buteo buteo*	Albacete	Spain	1	Cañizares, 2006
RAP	*Buteo buteo*	Burgos	Spain	1	Testa
RAP	*Buteo buteo*	Burgos	Spain	1	Eyser
RAP	*Buteo buteo*	Burgos	Spain	1	
RAP	*Buteo buteo*	Burgos	Spain	1	Eyser
RAP	*Buteo buteo*	Burgos	Spain	1	Eyser
RAP	*Buteo buteo*	Burgos	Spain	1	Eyser
RAP	*Buteo jamaicensis*	rivière Castle (Alberta)	Canada	1	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Col de Tehachapi	USA	8	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Montezuma Hills	USA	13	Howell y Noone, 1992 Howell, 1997 . En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Puerto de Altamont	USA	19	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Puerto de Altamont	USA	181	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Puerto de Altamont	USA	213	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Stateline (Oregon)	USA	2	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo jamaicensis*	Stateline (Washington)	USA	4	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo regalis*	Stateline (Oregon)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo regalis*	col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
RAP	*Buteo regalis*	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Buteo regalis*	Puerto de Altamont	USA	2	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	Buteo sp.	col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
RAP	Buteo sp.	Puerto de Altamont	USA	24	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	Buteo sp.	Puerto de Altamont	USA	9	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Buteo swainsoni*	McBride Lake (Alberta)	Canada	7	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
RAP	*Buteo swainsoni*	Puerto de Altamont	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Buteo swainsoni*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
RAP	Cadáveres de varias rapaces	Puerto de Altamont	USA	12	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
RAP	*Cathartes aura*	Mountaineer	USA	2	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
RAP	*Cathartes aura*	Puerto de Altamont	USA	4	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Cathartes aura*	Puerto de Altamont	USA	6	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Circaetus gallicus*	PESUR	Spain	6	Marti y Barrios, 1995.
RAP	*Circaetus gallicus*	Tarifa	Spain	1	Janss, 2000. En: Kingsley y Whittam, 2007.
RAP	*Circaetus gallicus*	Cádiz	Spain	1	Muñoz, 2008c
RAP	*Circaetus gallicus*	Cádiz	Spain	1	Muñoz, 2008f
RAP	*Circaetus gallicus*	Cádiz	Spain	1	Muñoz, 2008h
RAP	*Circaetus gallicus*	Cádiz	Spain	1	Muñoz, 2008i
RAP	*Circaetus gallicus*	Cádiz	Spain	1	Muñoz, 2008m
RAP	*Circaetus gallicus*	Cádiz	Spain	1	Fernández, 2008b
RAP	*Circaetus gallicus*	Cádiz	Spain	3	Fernández, 2009b
RAP	*Circaetus gallicus*	Burgos	Spain	1	Testa
RAP	*Circus aeroginosus*	Albacete	Spain	1	Cañizares, 2008d
RAP	*Circus cyaneus*	Foote Creek Rim	USA	1	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Circus cyaneus*	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Circus cyaneus*	Puerto de Altamont	USA	3	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Circus pygargus*	Nordrhein-Westfalen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Circus pygargus*	Cádiz	Spain	1	Muñoz, 2008b
RAP	*Circus pygargus*	Cádiz	Spain	1	Muñoz *et al*., 2009
RAP	*Circus pygargus*	Cádiz	Spain	1	Muñoz, 2008k
RAP	*Circus pygargus*	Cádiz	Spain	1	Muñoz, 2008o
RAP	*Circus pygargus*	Guadalajara	Spain	1	Ruiz, 2008c
RAP	*Circus pygargus*	Aragón	Spain	1	Rivas *et al*., 2004
RAP	*Clamator glandarius*	Cádiz	Spain	1	Muñoz, 2008o
RAP	*Clamator glandarius*	Albacete	Spain	1	Martínez-Acacio, 2005a
RAP	*Clamator glandarius*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
RAP	*Clamator glandarius*	Albacete	Spain	2	Cañizares, 2004
RAP	*Clamator glandarius*	Albacete	Spain	1	Torralba, 2004
RAP	*Elanus leucurus*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco columbarius*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco mexicanus*	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
RAP	*Falco mexicanus*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.

RAP	*Falco mexicanus*	Puerto de Altamont	USA	2	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
RAP	*Falco mexicanus*	Puerto de Altamont	USA	3	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco naumanni*	PESUR	Spain	18	Marti y Barrios, 1995
RAP	*Falco naumanni*	Cádiz	Spain	1	Clemente, 2009b
RAP	*Falco naumanni*	Cádiz	Spain	1	Fernández, 2008b
RAP	*Falco naumanni*	Cádiz	Spain	1	Fernández, 2009b
RAP	*Falco naumanni*	Cádiz	Spain	1	Cruz, 2009
RAP	*Falco naumanni*	Cádiz	Spain	1	Ornitour, 2008c
RAP	*Falco naumanni*	Cádiz	Spain	4	Lazo *et al*., 2008
RAP	*Falco naumanni*	Albacete	Spain	1	Domínguez y Erans, 2008
RAP	*Falco naumanni*	Albacete	Spain	1	Cañizares, 2006
RAP	*Falco naumanni*	Aragón	Spain	1	Sampietro *et al*., 2011
RAP	*Falco naumanni*	Aragón	Spain	1	Pelayo *et al*., 2001b
RAP	*Falco naumanni*	Aragón	Spain	1	Oper, 2004e
RAP	*Falco naumanni*	Aragón	Spain	1	Oper, 2006c
RAP	*Falco naumanni*	Aragón	Spain	1	Oper, 2005f
RAP	*Falco naumanni*	Aragón	Spain	1	Oper, 2004g
RAP	*Falco peregrinus*	Burgar Hill, Orkney	Escocia	1	Meek *et al*., 1993. En: Kingsley y Whittam, 2007.
RAP	*Falco peregrinus*	Vizkaya	Spain	2	Buenetxea, X. y Garaita, R. 2006.
RAP	*Falco peregrinus*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2002.
RAP	*Falco peregrinus*	Escaut	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
RAP	*Falco peregrinus*	Albacete	Spain	1	González, 2006b
RAP	*Falco peregrinus*	Aragón	Spain	1	Oper, 2004f
RAP	*Falco peregrinus*	Castilla y León	Spain	1	Interlab, 2009. Parque Eólico El Carril I y II
RAP	*Falco sp.*	Cádiz	Spain	1	Yarte, 2009
RAP	*Falco sp.*	Cádiz	Spain	2	Serrano, 2009
RAP	*Falco sparverius*	rivière Castle (Alberta)	Canada	2	Brown, comm. pers. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Col de Tehachapi	USA	7	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Foote Creek Rim	USA	3	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Montezuma Hills	USA	11	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Nine Canyon (Wyoming)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Puerto de Altamont	USA	4	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Puerto de Altamont	USA	49	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Puerto de Altamont	USA	59	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Puerto de Solano	USA	1	Bryne, 1983. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Stateline (Oregon)	USA	3	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco sparverius*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco subbuteo*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco subbuteo*	Guadalajara	Spain	1	Gutiérrez, 2008b
RAP	*Falco subbuteo*	Albacete	Spain	1	Cañizares, 2003
RAP	*Falco subbuteo*	Albacete	Spain	1	Fernández y Cañizares, 2001
RAP	*Falco subbuteo*	Aragón	Spain	2	EIN Castilla La Mancha, 2005c
RAP	*Falco subbuteo*	Aragón	Spain	1	EIN Castilla La Mancha, 2005d
RAP	*Falco tinnunculus*	Brandenburg	Germany	5	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco tinnunculus*	Nordrhein-Westfalen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco tinnunculus*	Sachsen-Anhalt	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Falco tinnunculus*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2004.
RAP	*Falco tinnunculus*	Guennda	Spain	1	Lekuona, 2001.
RAP	*Falco tinnunculus*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2004.
RAP	*Falco tinnunculus*	Navarra	Spain	1	Lekuona, 2001.
RAP	*Falco tinnunculus*	PESUR	Spain	24	Marti y Barrios, 1995.
RAP	*Falco tinnunculus*	Soria	Spain	1	Grupo I 2007 (informe 2º semestre de 2006).
RAP	*Falco tinnunculus*	Canal Boudewijn, Bruges	Netherlands	2	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008a.
RAP	*Falco tinnunculus*	Cádiz	Spain	3	Lobón y Villar, 2009a.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008b.
RAP	*Falco tinnunculus*	Cádiz	Spain	2	Lobón y Villar, 2009b.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008c.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008f.
RAP	*Falco tinnunculus*	Cádiz	Spain	2	Muñoz, 2008g.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008j.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Lobón y Villar, 2009d.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008k.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Arcosur Atlántico, 2009
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Yarte, 2009
RAP	*Falco tinnunculus*	Cádiz	Spain	3	Serrano, 2009
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008m.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008n.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008o.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Lobón y Villar, 2009f.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Muñoz, 2008p.
RAP	*Falco tinnunculus*	Cádiz	Spain	2	Fernández, 2009a.
RAP	*Falco tinnunculus*	Cádiz	Spain	4	Fernández, 2008b.
RAP	*Falco tinnunculus*	Cádiz	Spain	11	Fernández, 2008b 2009b.
RAP	*Falco tinnunculus*	Cádiz	Spain	1	Cruz, 2009.
RAP	*Falco tinnunculus*	Cádiz	Spain	11	Lazo *et al*., 2008.

RAP	*Falco tinnunculus*	Guadalajara	Spain	2	EIN Castilla La Mancha, 2005a.
RAP	*Falco tinnunculus*	Guadalajara	Spain	1	Merchen, 2008c
RAP	*Falco tinnunculus*	Guadalajara	Spain	1	Gutiérrez, 2008b
RAP	*Falco tinnunculus*	Albacete	Spain	1	Erans y Domínguez, 2007a
RAP	*Falco tinnunculus*	Albacete	Spain	1	Cañizares, 2003.
RAP	*Falco tinnunculus*	Albacete	Spain	1	Martínez-Acacio, 2004.
RAP	*Falco tinnunculus*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
RAP	*Falco tinnunculus*	Albacete	Spain	2	Cañizares, 2005.
RAP	*Falco tinnunculus*	Albacete	Spain	1	Mariño, 2007.
RAP	*Falco tinnunculus*	Albacete	Spain	1	Capilla Folgado *et al*., 2006a
RAP	*Falco tinnunculus*	Albacete	Spain	1	Capilla Folgado *et al*., 2008
RAP	*Falco tinnunculus*	Albacete	Spain	1	Capilla Folgado *et al*., 2007b
RAP	*Falco tinnunculus*	Albacete	Spain	1	Cañizares, 2006
RAP	*Falco tinnunculus*	Albacete	Spain	1	Cañizares, 2008d
RAP	*Falco tinnunculus*	Albacete	Spain	1	Vázquez, 2004
RAP	*Falco tinnunculus*	Albacete	Spain	1	Vázquez, 2003
RAP	*Falco tinnunculus*	Albacete	Spain	1	Domínguez, 2008
RAP	*Falco tinnunculus*	Albacete	Spain	1	Fernández y Cañizares, 2001
RAP	*Falco tinnunculus*	Albacete	Spain	1	Cañizares y Tortosa, 2003
RAP	*Falco tinnunculus*	Albacete	Spain	1	Tortosa, 2004
RAP	*Falco tinnunculus*	Aragón	Spain	1	Pelayo *et al*, 1999
RAP	*Falco tinnunculus*	Aragón	Spain	1	Pelayo *et al*., 2002
RAP	*Falco tinnunculus*	Aragón	Spain	1	Sáenz y Lizarraga, 2008
RAP	*Falco tinnunculus*	Aragón	Spain	1	Antón, 2006
RAP	*Falco tinnunculus*	Aragón	Spain	1	EIN Castilla La Mancha, 2005c
RAP	*Falco tinnunculus*	Aragón	Spain	5	EIN Castilla La Mancha, 2007
RAP	*Falco tinnunculus*	Aragón	Spain	1	Faci, 2004
RAP	*Falco tinnunculus*	Aragón	Spain	1	Sampietro *et al*., 2009
RAP	*Falco tinnunculus*	Aragón	Spain	1	Pelayo *et al*., 2001c
RAP	*Falco tinnunculus*	Aragón	Spain	1	Faci *et al*., 2003
RAP	*Falco tinnunculus*	Aragón	Spain	1	Faci, 2005b
RAP	*Falco tinnunculus*	Aragón	Spain	1	Rivas *et al*., 2004
RAP	*Falco tinnunculus*	Aragón	Spain	1	Oper, 2005e
RAP	*Falco tinnunculus*	Aragón	Spain	1	Faci, 2005c
RAP	*Falco tinnunculus*	Aragón	Spain	1	Gajón *et al*., 2006c
RAP	*Falco tinnunculus*	Aragón	Spain	3	Escudero, 2004
RAP	*Falco tinnunculus*	Aragón	Spain	1	Oper, 2004f
RAP	*Falco tinnunculus*	Aragón	Spain	1	Oper, 2005g
RAP	*Falco tinnunculus*	Aragón	Spain	2	EIN Castilla La Mancha, 2005d
RAP	*Falco tinnunculus*s	Aragón	Spain	1	Oper, 2006d
RAP	*Falco tinnunculus*	Aragón	Spain	1	L'auca, 2006
RAP	*Falco tinnunculus*	Castilla-La Mancha	Spain	1	Informe anual nº 2 (enero-diciembre 2005). PVA PE LA Alhambra
RAP	*Falco tinnunculus*	Castilla-La Mancha	Spain	1	Informe anual nº 5 (enero-diciembre 2008). PVA PE LA Alhambra
RAP	*Falco tinnunculus*	Burgos	Spain	1	Eyser, 2004 Parque Eólico La Magdalena
RAP	*Falco tinnunculus*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental, 2009. PE Lora I y II
RAP	*Falco tinnunculus*	Burgos	Spain	1	Ingeniería y Ciencia Ambiental, 2008. Parque Eólico El Cerro
RAP	*Falco tinnunculus*	Burgos	Spain	1	Castilla 99, 2005. Parque Eólico El Cerro
RAP	*Falco tinnunculus*	Albacete	Spain	1	González y Lozano, 2005
RAP	*Gyps fulvus*	Alaiz	Spain	11	Lekuona, 2001
RAP	*Gyps fulvus*	Álava	Spain	5	Consultora de Recursos Naturales S.L., 2007a
RAP	*Gyps fulvus*	Álava	Spain	7	Onrubia *et al*., 2003
RAP	*Gyps fulvus*	Álava	Spain	3	Onrubia *et al*., 2001
RAP	*Gyps fulvus*	E3	Spain	6	Marti y Barrios, 1995
RAP	*Gyps fulvus*	El Perdon	Spain	4	Lekuona, 2001
RAP	*Gyps fulvus*	Elgea-Urkilla	Spain	4	Onrubia *et al*., 2004
RAP	*Gyps fulvus*	Elgea-Urkilla	Spain	13	Consultora de Recursos Naturales, S.L., 2007b
RAP	*Gyps fulvus*	Elgea-Urkilla	Spain	8	Consultora de Recursos Naturales, S.L., 2006
RAP	*Gyps fulvus*	Elgea-Urkilla	Spain	11	Onrubia *et al*., 2005
RAP	*Gyps fulvus*	Guennda	Spain	8	Lekuona, 2001
RAP	*Gyps fulvus*	Guipúzcoa-Álava	Spain	13	Consultora de Recursos Naturales S.L., 2007b
RAP	*Gyps fulvus*	Guipúzcoa-Álava	Spain	8	Consultora de Recursos Naturales S.L., 2006
RAP	*Gyps fulvus*	Guipúzcoa-Álava	Spain	11	Onrubia *et al*., 2005
RAP	*Gyps fulvus*	Guipúzcoa-Álava	Spain	4	Onrubia *et al*., 2004
RAP	*Gyps fulvus*	Izco	Spain	11	Lekuona, 2001
RAP	*Gyps fulvus*	Leitza	Spain	1	Lekuona, 2001
RAP	*Gyps fulvus*	Navarra	Spain	53	Lekuona, 2001
RAP	*Gyps fulvus*	Navarra	Spain	11	Lekuona, 2001
RAP	*Gyps fulvus*	Navarra	Spain	11	Lekuona, 2001
RAP	*Gyps fulvus*	Navarra	Spain	8	Lekuona, 2001
RAP	*Gyps fulvus*	Navarra	Spain	4	Lekuona, 2001
RAP	*Gyps fulvus*	Navarra	Spain	1	Lekuona, 2001
RAP	*Gyps fulvus*	PESUR	Spain	67	Marti y Barrios, 1995
RAP	*Gyps fulvus*	Salajones	Spain	53	Lekuona, 2001
RAP	*Gyps fulvus*	Soria	Spain	2	CETASA, 2006a
RAP	*Gyps fulvus*	Soria	Spain	7	CETASA, 2006b
RAP	*Gyps fulvus*	Soria	Spain	2	Ingeniería y Ciencia Ambiental SL, 2002a
RAP	*Gyps fulvus*	Soria	Spain	1	Ingeniería y Ciencia Ambiental SL, 2003

RAP	*Gyps fulvus*	Soria	Spain	7	Ingeniería y Ciencia Ambiental SL, 2007
RAP	*Gyps fulvus*	Soria	Spain	13	Portulano, 2006b
RAP	*Gyps fulvus*	Soria	Spain	6	Portulano, 2006a
RAP	*Gyps fulvus*	Soria	Spain	1	Portulano, 2007
RAP	*Gyps fulvus*	Soria	Spain	9	Portulano, 2007
RAP	*Gyps fulvus*	Soria	Spain	1	Portulano, 2006c
RAP	*Gyps fulvus*	Soria	Spain	2	Portulano, 2006c
RAP	*Gyps fulvus*	Soria	Spain	1	Portulano, 2006c
RAP	*Gyps fulvus*	Soria	Spain	8	CETASA, 2006c
RAP	*Gyps fulvus*	Soria	Spain	8	CETASA, 2006d
RAP	*Gyps fulvus*	Soria	Spain	1	CETASA, 2006f
RAP	*Gyps fulvus*	Soria	Spain	5	ENDUSA, 2006
RAP	*Gyps fulvus*	Soria	Spain	23	ENDUSA, 2006
RAP	*Gyps fulvus*	Soria	Spain	6	Biovent energía, s.a. 2007a
RAP	*Gyps fulvus*	Soria	Spain	2	Biovent energía, s.a. 2007d
RAP	*Gyps fulvus*	Soria	Spain	2	Biovent energía, s.a. 2007e
RAP	*Gyps fulvus*	Soria	Spain	13	Biovent energía, s.a. 2006a
RAP	*Gyps fulvus*	Soria	Spain	10	Biovent energía, s.a. 2006b
RAP	*Gyps fulvus*	Soria	Spain	9	Biovent energía, s.a. 2007g
RAP	*Gyps fulvus*	Soria	Spain	1	Grupo I 2007 (informe 2º semestre de 2006)
RAP	*Gyps fulvus*	Soria	Spain	3	Grupo I 2007 (informe 2006)
RAP	*Gyps fulvus*	Tarifa	Spain	1	Janss, 2000. En: Kingsley y Whittam, 2007
RAP	*Gyps fulvus*	Vizkaya	Spain	1	Unamuno *et al.*, 2005
RAP	*Gyps fulvus*	Vizkaya	Spain	1	Unamuno *et al.*, 2006
RAP	*Gyps fulvus*	Vizkaya	Spain	1	Consultora de Recursos Naturales S.L., 2007c
RAP	*Gyps fulvus*	Cádiz	Spain	3	Muñoz, 2008a
RAP	*Gyps fulvus*	Cádiz	Spain	15	Lobón y Villar, 2009a
RAP	*Gyps fulvus*	Cádiz	Spain	4	Muñoz, 2008b
RAP	*Gyps fulvus*	Cádiz	Spain	7	Lobón y Villar, 2009b
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008c
RAP	*Gyps fulvus*	Cádiz	Spain	5	Muñoz, 2008d
RAP	*Gyps fulvus*	Cádiz	Spain	4	Lobón y Villar, 2009c
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008e
RAP	*Gyps fulvus*	Cádiz	Spain	10	Muñoz, 2008f
RAP	*Gyps fulvus*	Cádiz	Spain	1	Muñoz *et al.* 2009
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008g
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008h
RAP	*Gyps fulvus*	Cádiz	Spain	1	Muñoz, 2008i
RAP	*Gyps fulvus*	Cádiz	Spain	4	Muñoz, 2008j
RAP	*Gyps fulvus*	Cádiz	Spain	4	Lobón y Villar, 2009d
RAP	*Gyps fulvus*	Cádiz	Spain	1	Muñoz, 2008k
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008l
RAP	*Gyps fulvus*	Cádiz	Spain	2	Yarte, 2009
RAP	*Gyps fulvus*	Cádiz	Spain	1	Serrano, 2009
RAP	*Gyps fulvus*	Cádiz	Spain	3	Serrano, 2009
RAP	*Gyps fulvus*	Cádiz	Spain	8	Muñoz, 2008m
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008n
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008o
RAP	*Gyps fulvus*	Cádiz	Spain	7	Lobón y Villar, 2009f
RAP	*Gyps fulvus*	Cádiz	Spain	2	Muñoz, 2008p
RAP	*Gyps fulvus*	Cádiz	Spain	1	Clemente, 2009b
RAP	*Gyps fulvus*	Cádiz	Spain	8	Lobón y Villar, 2009g
RAP	*Gyps fulvus*	Cádiz	Spain	10	Fernández, 2008b
RAP	*Gyps fulvus*	Cádiz	Spain	6	Fernández, 2009b
RAP	*Gyps fulvus*	Cádiz	Spain	1	Fernández, 2009b
RAP	*Gyps fulvus*	Cádiz	Spain	20	Cruz, 2009
RAP	*Gyps fulvus*	Cádiz	Spain	7	Ornitour, 2008b 2008d 2008e
RAP	*Gyps fulvus*	Cádiz	Spain	3	Lobón y Villar, 2008
RAP	*Gyps fulvus*	Burgos	Spain	9	Eyser, 2004. PE La Magdalena
RAP	*Gyps fulvus*	Burgos	Spain	1	Ingeniería y Ciencia Ambiental S.L., 2008
RAP	*Gyps fulvus*	Guadalajara	Spain	4	EIN Castilla La Mancha, 2005a
RAP	*Gyps fulvus*	Guadalajara	Spain	3	Parra, 2008a
RAP	*Gyps fulvus*	Guadalajara	Spain	6	Herranz, 2006
RAP	*Gyps fulvus*	Guadalajara	Spain	7	Parra, 2008b
RAP	*Gyps fulvus*	Guadalajara	Spain	2	Herranz y López-Tello, 2006
RAP	*Gyps fulvus*	Guadalajara	Spain	2	Anónimo, 2008
RAP	*Gyps fulvus*	Guadalajara	Spain	1	Ruiz, 2008b
RAP	*Gyps fulvus*	Guadalajara	Spain	4	Gutiérrez, 2008a
RAP	*Gyps fulvus*	Guadalajara	Spain	1	Gutiérrez, 2008b
RAP	*Gyps fulvus*	Albacete	Spain	1	Torralba, 2005
RAP	*Gyps fulvus*	Albacete	Spain	1	Cañizares, 2008b
RAP	*Gyps fulvus*	Albacete	Spain	1	Cañizares, 2008d
RAP	*Gyps fulvus*	Albacete	Spain	1	Cañizares, 2008e
RAP	*Gyps fulvus*	Albacete	Spain	1	Vázquez y Uña, 2005
RAP	*Gyps fulvus*	Aragón	Spain	1	Pelayo *et al.*, 2002
RAP	*Gyps fulvus*	Aragón	Spain	2	Sáenz y Lizarraga, 2001
RAP	*Gyps fulvus*	Aragón	Spain	4	Sáenz y Lizarraga, 2002
RAP	*Gyps fulvus*	Aragón	Spain	3	Antón, 2005b
RAP	*Gyps fulvus*	Aragón	Spain	1	Gajón *et al.*, 2006a

RAP	*Gyps fulvus*	Aragón	Spain	1	Pelayo *et al*., 2001b
RAP	*Gyps fulvus*	Aragón	Spain	1	Faci *et al*., 2003
RAP	*Gyps fulvus*	Aragón	Spain	5	Faci, 2005b
RAP	*Gyps fulvus*	Aragón	Spain	1	Gajón *et al*., 2006b
RAP	*Gyps fulvus*	Aragón	Spain	18	Rivas *et al*., 2003
RAP	*Gyps fulvus*	Aragón	Spain	32	Rivas *et al*., 2004
RAP	*Gyps fulvus*	Aragón	Spain	13	Icarus, 2005
RAP	*Gyps fulvus*	Aragón	Spain	12	Oper, 2003
RAP	*Gyps fulvus*	Aragón	Spain	9	Oper, 2004c
RAP	*Gyps fulvus*	Aragón	Spain	8	Oper, 2005d
RAP	*Gyps fulvus*	Aragón	Spain	1	Faci, 2005c
RAP	*Gyps fulvus*	Aragón	Spain	5	Escudero, 2004
RAP	*Gyps fulvus*	Aragón	Spain	1	Oper, 2004e
RAP	*Gyps fulvus*	Aragón	Spain	6	Oper, 2006c
RAP	*Gyps fulvus*	Aragón	Spain	1	Oper, 2005f
RAP	*Gyps fulvus*	Aragón	Spain	4	Oper, 2004g
RAP	*Gyps fulvus*	Aragón	Spain	3	Oper, 2005g
RAP	*Gyps fulvus*	Aragón	Spain	1	EIN Castilla La Mancha, 2005d
RAP	*Gyps fulvus*	Aragón	Spain	14	Camiña *et al*., 2007
RAP	*Gyps fulvus*	Aragón	Spain	3	Martín-Barajas *et al*., 2006
RAP	*Gyps fulvus*	Aragón	Spain	6	Oper, 2005h
RAP	*Gyps fulvus*	Aragón	Spain	10	Oper, 2006d
RAP	*Gyps fulvus*	Aragón	Spain	1	ICA, 2006b
RAP	*Gyps fulvus*	Aragón	Spain	4	L'auca, 2006
RAP	*Gyps fulvus*	Aragón	Spain	3	Saenz, 2003
RAP	*Gyps fulvus*	Castilla-La Mancha	Spain	2	Informe anual nº 4 (enero-diciembre 2007). PVA
RAP	*Gyps fulvus*	Castilla-La Mancha	Spain	2	Informe anual nº 3 (enero-diciembre 2006). PVA
RAP	*Gyps fulvus*	Burgos	Spain	1	Eyser, 2005. PE La Magdalena
RAP	*Gyps fulvus*	Burgos	Spain	3	Eyser, 2007. PE La Magdalena
RAP	*Gyps fulvus*	Burgos	Spain	7	Econima, 2006. PE La Magdalena
RAP	*Gyps fulvus*	Burgos	Spain	1	Testa, 2009. PE La Magdalena
RAP	*Gyps fulvus*	Burgos	Spain	12	Testa, 2008. PE La Magdalena
RAP	*Gyps fulvus*	Burgos	Spain	2	EOS Ingeniería y Consultoría Ambiental, 2009. PE Lora I y II
RAP	*Gyps fulvus*	Burgos	Spain	2	Testa. 2004. PE La Sía
RAP	*Gyps fulvus*	Burgos	Spain	2	EOS Ingeniería y Consultoría Ambiental, 2007. PE La Sía
RAP	*Gyps fulvus*	Burgos	Spain	4	EOS Ingeniería y Consultoría Ambiental, 2008. PE La Sía
RAP	*Gyps fulvus*	Burgos	Spain	3	EOS Ingeniería y Consultoría Ambiental, 2008. Lora I y II (línea eléctrica)
RAP	*Gyps fulvus*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental, 2008. Lora I y II
RAP	*Gyps fulvus*	Burgos	Spain	3	Eyser, 2005. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	1	Eyser, 2004. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	18	Testa, 2007. PE Urbel del Castillo
RAP	*Gyps fulvus*	Burgos	Spain	7	Testa, 2008. PE Urbel del Castillo
RAP	*Gyps fulvus*	Burgos	Spain	7	EOS Ingeniería y Consultoría Ambiental, 2007. PE El Perúl
RAP	*Gyps fulvus*	Burgos	Spain	4	EOS Ingeniería y Consultoría Ambiental, 2008. PE El Perúl
RAP	*Gyps fulvus*	Burgos	Spain	2	EOS Ingeniería y Consultoría Ambiental, 2009. PE La Calzada
RAP	*Gyps fulvus*	Burgos	Spain	4	Ingeniería y Ciencia Ambiental, 2008. PE El Cerro
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla 99, 2004. PE La Torrada
RAP	*Gyps fulvus*	Burgos	Spain	5	EOS Ingeniería y Consultoría Ambiental, 2007. PE Montejo
RAP	*Gyps fulvus*	Burgos	Spain	5	Testa, 2008. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	3	Iberinco, 2007. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	3	Econima, 2006. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	4	EOS Ingeniería y Consultoría Ambiental, 2005. PE La Sía
RAP	*Gyps fulvus*	Burgos	Spain	2	Castilla 99, 2003. PE El Canto y ampliación
RAP	*Gyps fulvus*	Burgos	Spain	6	Castilla 99, 2005. PE El Canto y ampliación
RAP	*Gyps fulvus*	Burgos	Spain	8	Castilla 99, 2006. PE El Canto y ampliación
RAP	*Gyps fulvus*	Burgos	Spain	10	Ingeniería y Ciencia Ambiental, 2007. PE El Canto y ampliación
RAP	*Gyps fulvus*	Burgos	Spain	4	Ingeniería y Ciencia Ambiental, 2008. PE El Canto y ampliación
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla 99, 2003. PE El Cerro
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla 99, 2007. Lodoso
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla, 99, 2009. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla, 99, 2009. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla, 99, 2009. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla 99, 2003. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla 99, 2002. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	1	Castilla 99, 2005. PE Valdeporres
RAP	*Gyps fulvus*	Burgos	Spain	2	
RAP	*Gyps fulvus*	Burgos	Spain	5	
RAP	*Gyps fulvus*	Burgos	Spain	1	
RAP	*Gyps fulvus*	Burgos	Spain	14	
RAP	*Gyps fulvus*	Burgos	Spain	3	
RAP	*Gyps fulvus*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental, 206. PE Montejo
RAP	*Gyps fulvus*	Burgos	Spain	6	EOS Ingeniería y Consultoría Ambiental, 2008. PE Montejo
RAP	*Gyps fulvus*	Burgos	Spain	2	EOS Ingeniería y Consultoría Ambiental, 2009. PE Montejo
RAP	*Gyps fulvus*	Burgos	Spain	1	
RAP	*Gyps fulvus*	Burgos	Spain	1	
RAP	*Gyps fulvus*	Burgos	Spain	2	
RAP	Halcón sp.	Puerto de Altamont	USA	58	Anderson et Estep, 1988. En: Kingsley y Whittam, 2007.
RAP	*Haliaeetus albicilla*	Brandenburg	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.

RAP	*Haliaeetus albicilla*	Mecklenburg-Vorpommem	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Haliaeetus albicilla*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Haliaeetus albicilla*	Schleswig-Holstein	Germany	6	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Hieraaetus fasciatus*	Cádiz	Spain	1	Muñoz, 2008l
RAP	*Hieraaetus pennatus*	Izco	Spain	1	Lekuona, 2001.
RAP	*Hieraaetus pennatus*	Navarra	Spain	1	Lekuona, 2001.
RAP	*Hieraaetus pennatus*	Soria	Spain	1	Biovent energía, s.a. 2007g.
RAP	*Hieraaetus pennatus*	Cádiz	Spain	1	Lobón y Villar, 2009a
RAP	*Hieraaetus pennatus*	Cádiz	Spain	1	Muñoz, 2008g
RAP	*Hieraaetus pennatus*	Cádiz	Spain	1	Yarte, 2009
RAP	*Hieraaetus pennatus*	Cádiz	Spain	1	Lobón y Villar, 2009g
RAP	*Hieraaetus pennatus*	Cádiz	Spain	2	Lazo *et al.*, 2008
RAP	*Hieraaetus pennatus*	Guadalajara	Spain	1	Ruiz, 2008c.
RAP	*Hieraaetus pennatus*	Guadalajara	Spain	1	Merchen, 2008c
RAP	*Hieraaetus pennatus*	Guadalajara	Spain	1	Parra, 2008d
RAP	*Hieraaetus pennatus*	Albacete	Spain	1	Domínguez, 2008
RAP	*Hieraaetus pennatus*	Aragón	Spain	2	Camiña *et al.*, 2007
RAP	*Milvus migrans*	Brandenburg	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus migrans*	PESUR	Spain	2	Marti y Barrios, 1995.
RAP	*Milvus migrans*	Cádiz	Spain	2	Lobón y Villar, 2009a
RAP	*Milvus migrans*	Cádiz	Spain	1	Lobón y Villar, 2009b
RAP	*Milvus migrans*	Cádiz	Spain	1	Lobón y Villar, 2009d
RAP	*Milvus migrans*	Cádiz	Spain	1	Yarte, 2009
RAP	*Milvus migrans*	Cádiz	Spain	1	Lobón y Villar, 2009g
RAP	*Milvus migrans*	Cádiz	Spain	1	Cruz, 2009
RAP	*Milvus migrans*	Albacete	Spain	1	Tortosa, 2004
RAP	*Milvus migrans*	Aragón	Spain	1	Pelayo *et al.*, 2001
RAP	*Milvus migrans*	Aragón	Spain	1	Oper, 2004c
RAP	*Milvus migrans*	Aragón	Spain	2	Oper, 2004e
RAP	*Milvus migrans*	Aragón	Spain	1	Oper, 2006c
RAP	*Milvus migrans*	Aragón	Spain	2	Oper, 2005g
RAP	*Milvus migrans*	Aragón	Spain	1	Oper, 2006d
RAP	*Milvus milvus*	Brandenburg	Germany	17	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Hessen, BW	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Mecklenburg-Vorpomme rn	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Nordrhein-Westfalen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Sachsen	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Sachsen-Anhalt	Germany	10	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Thüringen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
RAP	*Milvus milvus*	Soria	Spain	1	CETASA, 2006f.
RAP	*Milvus milvus*	Cádiz	Spain	1	Lobón y Villar, 2009a
RAP	*Milvus milvus*	Burgos	Spain	1	EOS, Ingeniería y Consultoría Ambiental. Parque Eólico El Perul, 2008.
RAP	*Milvus milvus*	Burgos	Spain	1	Ecomina. Parque eólico Valdeorres. 2007.
RAP	*Milvus milvus*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental. Parque eólico Lodoso. 2007
RAP	*Milvus milvus*	Burgos	Spain	1	Parque eólico Marmellar, 2009
RAP	*Milvus milvus*	Guadalajara	Spain	1	Parra, 2008b.
RAP	*Milvus milvus*	Aragón	Spain	1	Rivas *et al.*, 2004
RAP	*Milvus milvus*	Aragón	Spain	1	Oper, 2004c
RAP	*Milvus milvus*	Aragón	Spain	3	Oper, 2006c
RAP	*Milvus milvus*	Aragón	Spain	1	Oper, 2005g
RAP	*Neophron percnopterus*	Cádiz	Spain	2	Muñoz *et al.*, 2009
RAP	*Neophron percnopterus*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental, 2007
RAP	*Pandion haliaetus*	Cádiz	Spain	1	Muñoz, 2008n
RAP	*Pernis apivorus*	Albacete	Spain	1	Capilla Folgado *et al.*, 2007a
RAP	Rapaces sin identificar	PESUR	Spain	2	Marti y Barrios, 1995.
RAP	Rapaces sin identificar	Puerto de Altamont	USA	16	Smallwood yThelander, 2004. En: Kingsley y Whittam, 2007.
RAP	Rapaces sin identificar	Puerto de Altamont	USA	12	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
RAP	Rapaces sin identificar	Puerto de Altamont	USA	1	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
GAL	*Alectoris chuckar*	Col de Tehachapi	USA	2	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
GAL	*Alectoris chuckar*	Stateline (Oregon)	USA	3	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
GAL	*Alectoris chuckar*	Stateline (Washington)	USA	4	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
GAL	*Alectoris chuckar*	Vansycle (Oregon)	USA	1	Strickland *et al.*, 2000b. En: Kingsley y Whittam, 2007.
GAL	*Alectoris rufa*	Navarra	Spain	1	Lekuona, 2001.
GAL	*Alectoris rufa*	Soria	Spain	1	Portulano, 2007.
GAL	*Alectoris rufa*	Vizkaya	Spain	1	Unamuno *et al.*, 2005.
GAL	*Bonasa umbellus*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
GAL	*Callipepla californica*	Col de Tehachapi	USA	2	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
GAL	*Coturnix coturnix*	Soria	Spain	1	Portulano, 2006b.
GAL	*Coturnix coturnix*	Soria	Spain	1	Portulano, 2006c.
GAL	*Coturnix coturnix*	Cádiz	Spain	1	Fernández, 2009b
GAL	*Coturnix coturnix*	Guadalajara	Spain	1	Parra, 2008a
GAL	*Coturnix coturnix*	Guadalajara	Spain	1	Anónimo, 2008
GAL	*Coturnix coturnix*	Guadalajara	Spain	1	Ruiz, 2008b
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2003

GAL	*Coturnix coturnix*	Albacete	Spain	1	Martínez-Acacio, 2004
GAL	*Coturnix coturnix*	Albacete	Spain	1	Martínez-Acacio, 2005a
GAL	*Coturnix coturnix*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2004
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2004
GAL	*Coturnix coturnix*	Albacete	Spain	1	Mariño, 2007
GAL	*Coturnix coturnix*	Albacete	Spain	1	Torralba, 2005
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2006
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2005
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2006
GAL	*Coturnix coturnix*	Albacete	Spain	1	Gónzalez y Lozano, 2004
GAL	*Coturnix coturnix*	Albacete	Spain	1	Gónzalez y Lozano, 2005
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2008e
GAL	*Coturnix coturnix*	Albacete	Spain	1	Cañizares, 2008e
GAL	*Coturnix coturnix*	Albacete	Spain	1	Vázquez, 2004
GAL	*Coturnix coturnix*	Albacete	Spain	1	Vázquez, 2004
GAL	*Coturnix coturnix*	Albacete	Spain	1	Vázquez, 2005
GAL	*Coturnix coturnix*	Albacete	Spain	1	Lozano, 2006
GAL	*Coturnix coturnix*	Albacete	Spain	1	Lozano, 2008
GAL	*Coturnix coturnix*	Albacete	Spain	1	Tortosa, 2004
GAL	*Coturnix coturnix*	Aragón	Spain	1	Sáenz y Lizarraga, 2004
GAL	*Coturnix coturnix*	Aragón	Spain	1	Oper, 2005f
GAL	*Galerida cristata*	Cádiz	Spain	1	Muñoz, 2008b
GAL	*Galerida cristata*	Cádiz	Spain	1	Muñoz, 2008i
GAL	*Galerida cristata*	Cádiz	Spain	1	Muñoz, 2008k
GAL	*Galerida cristata*	Cádiz	Spain	1	Muñoz, 2008n
GAL	*Galerida cristata*	Cádiz	Spain	2	Lazo *et al.*, 2008
GAL	*Galerida cristata*	Albacete	Spain	2	Mariño, 2007
GAL	*Galerida cristata*	Albacete	Spain	1	Martínez-Acacio, 2003
GAL	*Galerida cristata*	Albacete	Spain	1	Cañizares y Torralba, 2004
GAL	*Galerida cristata*	Albacete	Spain	1	Capilla Folgado *et al.*, 2006a
GAL	*Galerida cristata*	Albacete	Spain	1	Capilla Folgado *et al.*, 2007a
GAL	*Galerida cristata*	Albacete	Spain	1	Cañizares, 2005
GAL	*Galerida cristata*	Albacete	Spain	1	Cañizares, 2006
GAL	*Galerida cristata*	Albacete	Spain	3	Gónzalez y Lozano, 2005
GAL	*Galerida cristata*	Albacete	Spain	1	Lozano, 2006
GAL	*Galerida cristata*	Albacete	Spain	1	González, 2006b
GAL	*Galerida cristata*	Albacete	Spain	1	González, 2006c
GAL	*Galerida cristata*	Albacete	Spain	2	Domínguez, 2008
GAL	*Galerida cristata*	Albacete	Spain	1	Fernández y Cañizares, 2001
GAL	*Galerida cristata*	Albacete	Spain	1	Tortosa, 2004
GAL	*Galerida cristata*	Aragón	Spain	1	Pelayo *et al.*, 2001
GAL	*Galerida cristata*	Aragón	Spain	3	Oper, 2005a
GAL	*Galerida cristata*	Aragón	Spain	1	Antón, 2005a
GAL	*Galerida cristata*	Aragón	Spain	1	EIN Castilla La Mancha, 2005c
GAL	*Galerida cristata*	Aragón	Spain	1	EIN Castilla La Mancha, 2007
GAL	*Galerida cristata*	Aragón	Spain	1	Enviria, 2006
GAL	*Galerida cristata*	Aragón	Spain	3	Faci *et al.*, 2005
GAL	*Galerida cristata*	Aragón	Spain	4	Oper, 2004a
GAL	*Galerida cristata*	Aragón	Spain	4	Oper, 2005b
GAL	*Galerida cristata*	Aragón	Spain	3	Oper, 2004b
GAL	*Galerida cristata*	Aragón	Spain	4	Oper, 2005c
GAL	*Galerida cristata*	Aragón	Spain	2	Oper, 2006a
GAL	*Galerida cristata*	Aragón	Spain	1	Oper, 2003
GAL	*Galerida cristata*	Aragón	Spain	2	Oper, 2004c
GAL	*Galerida cristata*	Aragón	Spain	1	Oper, 2005d
GAL	*Galerida cristata*	Aragón	Spain	5	Oper, 2004d
GAL	*Galerida cristata*	Aragón	Spain	3	Oper, 2005e
GAL	*Galerida cristata*	Aragón	Spain	2	Oper, 2006b
GAL	*Galerida cristata*	Aragón	Spain	1	Oper, 2004e
GAL	*Galerida cristata*	Aragón	Spain	1	Oper, 2004f
GAL	*Galerida cristata*	Aragón	Spain	3	Oper, 2004g
GAL	*Galerida cristata*	Aragón	Spain	2	Oper, 2005g
GAL	*Galerida cristata*	Aragón	Spain	1	Oper, 2006d
GAL	*Galerida cristata*	Aragón	Spain	1	Icarus, 2006
GAL	*Galerida cristata*	Aragón	Spain	1	L'auca, 2006
GAL	*Galerida cristata*	Castilla-La Mancha	Spain	1	Informe anual nº 5 (enero-diciembre 2008). PVA Cristo de los Bailones
GAL	*Meleagris gallopavo*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
GAL	*Perdix perdix*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
GAL	*Perdix perdix*	McBride Lake (Alberta)	Canada	1	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
GAL	*Perdix perdix*	Buffalo Ridge	USA	1	Johnson *et al.*, 2002. En: Kingsley y Whittam, 2007.
GAL	*Perdix perdix*	Stateline (Oregon)	USA	4	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
GAL	*Perdix perdix*	Stateline (Washington)	USA	3	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
GAL	*Perdix perdix*	Vansycle (Oregon)	USA	2	Strickland *et al.*, 2000b. En: Kingsley y Whittam, 2007.
GAL	Perdiz sp.	Vansycle (Oregon)	USA	1	Strickland *et al.*, 2000b. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Niedersachsen	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Guennda	Spain	1	Lekuona, 2001.

GAL	*Phasianus colchicus*	Navarra	Spain	1	Lekuona, 2001.
GAL	*Phasianus colchicus*	Canal Boudewijn, Bruges	Netherlands	3	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Buffalo Ridge	USA	2	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Nine Canyon (Washingt on)	USA	5	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Stateline (Oregon)	USA	14	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Stateline (Washington)	USA	3	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
GAL	*Phasianus colchicus*	Guadalajara	Spain	1	Parra, 2008a.
GAL	*Scolopax rusticola*	Guadalajara	Spain	1	Gutiérrez, 2008a
GAL	*Scolopax rusticola*	Albacete	Spain	1	Vázquez, 2004
GAL	*Serinus serinus*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
GAL	*Serinus serinus*	Albacete	Spain	1	Cañizares *et al*., 2008
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2004b
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2005c
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2004c
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2005d
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2004d
GAL	*Serinus serinus*	Aragón	Spain	1	Faci, 2005c
GAL	*Serinus serinus*	Aragón	Spain	2	Oper, 2006c
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2004f
GAL	*Serinus serinus*	Aragón	Spain	1	Oper, 2005f
GAL	*Serinus serinus*	Aragón	Spain	2	Oper, 2005g
GAL	*Serinus serinus*	Aragón	Spain	4	Oper, 2005h
GAL	*Serinus serinus*	Aragón	Spain	2	Oper, 2006d
GAL	*Streptopelia decaocto*	Albacete	Spain	2	Gónzalez y Lozano, 2005
GAL	*Streptopelia turtur*	Albacete	Spain	1	González, 2006a
GAL	*Streptopelia turtur*	Albacete	Spain	2	Cañizares, 2003.
GAL	*Streptopelia turtur*	Albacete	Spain	1	Martínez-Acacio, 2004.
GAL	*Streptopelia turtur*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
GAL	*Streptopelia turtur*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
GAL	*Streptopelia turtur*	Albacete	Spain	1	Cañizares, 2005.
GAL	*Streptopelia turtur*	Albacete	Spain	1	González y Tortosa, 2006.
GAL	*Streptopelia turtur*	Albacete	Spain	1	Martínez-Acacio, 2003
GAL	*Streptopelia turtur*	Albacete	Spain	1	Capilla Folgado *et al*., 2006a
GAL	*Streptopelia turtur*	Albacete	Spain	1	Capilla Folgado *et al*., 2007a
GAL	*Streptopelia turtur*	Albacete	Spain	1	Capilla Folgado *et al*., 2007b
GAL	*Streptopelia turtur*	Albacete	Spain	3	Cañizares, 2006
GAL	*Streptopelia turtur*	Albacete	Spain	2	Gónzalez y Lozano, 2005
GAL	*Streptopelia turtur*	Albacete	Spain	1	Cañizares, 2008e
GAL	*Streptopelia turtur*	Albacete	Spain	2	Vázquez, 2004
GAL	*Streptopelia turtur*	Albacete	Spain	1	Vázquez, 2005
GAL	*Streptopelia turtur*	Albacete	Spain	1	Lozano, 2006
GAL	*Streptopelia turtur*	Albacete	Spain	2	González, 2007
GAL	*Streptopelia turtur*	Albacete	Spain	1	González, 2006c
GAL	*Streptopelia turtur*	Albacete	Spain	3	Domínguez, 2008
GAL	*Streptopelia turtur*	Aragón	Spain	1	Gajón *et al*., 2006c
GAL	*Streptopelia turtur*	Aragón	Spain	1	Oper, 2006c
GAL	*Tympanuchus phasianellus*	McBride Lake (Alberta)	Canada	2	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
GRU	*Grus grus*	Cádiz	Spain	1	Muñoz, 2008d
GRU	*Grus grus*	Soria	Spain	1	Portulano, 2006a.
GRU	*Otis tarda*	Albacete	Spain	2	Cañizares, 2006
GRU	*Tetrax tetrax*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
LIM	*Burhinus oedicnemus*	Albacete	Spain	1	Gónzalez y Lozano, 2004
LIM	*Burhinus oedicnemus*	Albacete	Spain	2	Gónzalez y Lozano, 2005
LIM	*Burhinus oedicnemus*	Albacete	Spain	1	Vázquez, 2004
LIM	*Burhinus oedicnemus*	Albacete	Spain	1	Vázquez, 2005
LIM	*Burhinus oedicnemus*	Albacete	Spain	1	Lozano, 2006
LIM	*Burhinus oedicnemus*	Albacete	Spain	1	González, 2006c
LIM	*Burhinus oedicnemus*	Albacete	Spain	2	Fernández y Cañizares, 2001
LIM	*Burhinus oedicnemus*	Albacete	Spain	1	Cañizares y Tortosa, 2003
LIM	*Burhinus oedicnemus*	Aragón	Spain	1	Gajón *et al*., 2006a
LIM	*Burhinus oedicnemus*	Aragón	Spain	1	Oper, 2004f
LIM	*Calidris canutus*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R., 2006.
LIM	*Charadrius vociferus*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
LIM	Escolopácida sin identificar	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
LIM	*Gallinago gallinago*	Mynydd Cemmaes	United kingdom	1	Dulas Engineering Ltd., 1995.
LIM	*Gallinago gallinago*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental, 2009. PE Lora I y II
LIM	*Haematopus ostralegus*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
LIM	*Haematopus ostralegus*	Schleswig-Holstein	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
LIM	*Haematopus ostralegus*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
LIM	*Pluvialis apricaria*	Cádiz	Spain	1	Muñoz, 2008d
LIM	*Pluvialis squatarola*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
LIM	*Recurvirostra americana*	Puerto de Altamont	USA	3	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
LIM	*Tringa flavipes*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
LIM	*Tringa totanus*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	Gaviota sp.	McBride Lake (Alberta)	Canada	2	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
GAV	Láridos sin identificar	Puerto de Altamont	USA	4	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
GAV	Láridos sin identificar	Puerto de Altamont	USA	18	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.

GAV	*Larus argentatus*	Niedersachsen	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Sachsen	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R. 2006.
GAV	*Larus argentatus*	Barrage de l'Est, Zeebrugge	Netherlands	34	Everaert *et al*., 2002 .En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Barrage de l'Est, Zeebrugge	Netherlands	34	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Canal Boudewijn, Bruges	Netherlands	7	Everaert *et al*., 2002 .En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Canal Boudewijn, Bruges	Netherlands	97	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Buffalo Ridge	USA	1	Strickland *et al*., 2000. En: Kingsley y Whittam, 2007.
GAV	*Larus argentatus*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
GAV	*Larus cachinnans*	Vizkaya	Spain	12	Buenetxea, X. y Garaita, R. 2006.
GAV	Larus cachinnans	Cádiz	Spain	3	Clemente, 2009a
GAV	*Larus californicus*	Puerto de Altamont	USA	1	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
GAV	*Larus californicus*	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
GAV	*Larus californicus*	Puerto de Altamont	USA	7	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus canus*	Brandenburg	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus canus*	Niedersachsen	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus canus*	Sachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus canus*	Canal Boudewijn, Bruges	Netherlands	3	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus delawarensis*	Puerto de Altamont	USA	4	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus fuscus*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus fuscus*	Barrage de l'Est, Zeebrugge	Netherlands	8	Everaert *et al*., 2002. En: Kingsley y Whittam, 2007.
GAV	*Larus fuscus*	Barrage de l'Est, Zeebrugge	Netherlands	10	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus fuscus*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2002. En: Kingsley y Whittam, 2007.
GAV	*Larus fuscus*	Canal Boudewijn, Bruges	Netherlands	25	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus fuscus*	Cádiz	Spain	1	Clemente, 2009a
GAV	*Larus marinus*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2002 .En: Kingsley y Whittam, 2007.
GAV	*Larus marinus*	Barrage de l'Est, Zeebrugge	Netherlands	5	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus minutus*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
GAV	*Larus ridibundus*	Brandenburg	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
GAV	*Larus ridibundus*	Burgar Hill, Orkney	United kingdom	3	Meek *et al*., 1993. En: Kingsley y Whittam, 2007.
GAV	*Larus ridibundus*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus ridibundus*	Canal Boudewijn, Bruges	Netherlands	8	Everaert *et al*., 2002.
GAV	*Larus ridibundus*	Canal Boudewijn, Bruges	Netherlands	47	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Larus ridibundus*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
GAV	*Rissa tridactyla*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2002. En: Kingsley y Whittam, 2007.
GAV	*Rissa tridactyla*	Burgos	Spain	1	Testa. Parque Eólico Urbel del Castillo
GAV	*Sterna albifrons*	Barrage de l'Est, Zeebrugge	Netherlands	2	Everaert *et al*., 2002. En: Kingsley y Whittam, 2007.
GAV	*Sterna albifrons*	Barrage de l'Est, Zeebrugge	Netherlands	2	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Sterna hirundo*	Barrage de l'Est, Zeebrugge	Netherlands	3	Everaert *et al*., 2002 .En: Kingsley y Whittam, 2007.
GAV	*Sterna hirundo*	Barrage de l'Est, Zeebrugge	Netherlands	4	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
GAV	*Sterna hirundo*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	Foote Creek Rim	USA	1	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Alberta — rivière Castle	Canada	1	Brown y Hamilton, 2002. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Rivière Castle (Alberta)	Canada	1	Brown, comm. pers. . En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Col de Tehachapi	USA	9	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Montezuma Hills	USA	3	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Mountaineer	USA	1	Kerns et Kerlinger, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Puerto de Altamont	USA	15	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Puerto de Altamont	USA	92	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Puerto de Altamont	USA	196	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	San Gorgonio	USA	8	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
COL	*Columba livia*	Stateline (Oregon)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba livia f. domestica*	Brandenburg	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba livia f. domestica*	Brandenburg	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba livia f. domestica*	Guennda	Spain	1	Lekuona, 2001.
COL	*Columba livia f. domestica*	Izco	Spain	1	Lekuona, 2001.
COL	*Columba livia f. domestica*	Barrage de l'Est, Zeebrugge	Netherlands	2	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
COL	*Columba livia f. domestica*	Canal Boudewijn, Bruges	Netherlands	2	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
COL	*Columba livia f. domestica*	Escaut	Netherlands	3	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
COL	*Columba livia f. domestica*	Canal Boudewijn, Bruges	Netherlands	2	Everaert *et al*., 2002. En: Kingsley y Whittam, 2007.
COL	*Columba oenas*	Soria	Spain	1	Portulano, 2007.
COL	*Columba oenas*	Soria	Spain	1	Portulano, 2006b.
COL	*Columba oenas*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
COL	*Columba palumbus*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba palumbus*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba palumbus*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba palumbus*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
COL	*Columba palumbus*	Elgea-Urkilla	Spain	2	Onrubia *et al*., 2004.
COL	*Columba palumbus*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2005.
COL	*Columba palumbus*	Guennda	Spain	1	Lekuona, 2001.
COL	*Columba palumbus*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2005.
COL	*Columba palumbus*	Guipúzcoa-Álava	Spain	2	Onrubia *et al*., 2004.
COL	*Columba palumbus*	Navarra	Spain	1	Lekuona, 2001.
COL	*Columba palumbus*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
COL	*Columba sp.*	Navarra	Spain	1	Lekuona, 2001.

COL	*Columba sp.*	Navarra	Spain	1	Lekuona, 2001.
COL	*Pterocles alchata*	Albacete	Spain	1	Mariño, 2007.
COL	*Pterocles alchata*	Albacete	Spain	2	Gónzalez y Lozano, 2005
COL	*Pterocles alchata*	Albacete	Spain	1	Cañizares, 2008e
COL	*Pterocles orientalis*	Albacete	Spain	2	Fernández y Cañizares, 2001
COL	*Zenaida macroura*	Alberta — rivière Castle	Canada	2	Brown y Hamilton, 2002. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	Rivière Castle (Alberta)	Canada	2	Brown, comm. pers. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	Col de Tehachapi	USA	6	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	Puerto de Altamont	USA	1	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	Puerto de Altamont	USA	34	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
COL	*Zenaida macroura*	San Gorgonio	USA	1	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
CUC	*Coccyzus americanus*	Mountaineer	USA	4	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
CUC	*Coccyzus erythropthalmus*	Mountaineer	USA	2	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
CUC	*Cuculus canorus*	Navarra	Spain	1	Lekuona, 2001
CUC	*Cuculus canorus*	El Perdon	Spain	1	Lekuona, 2001
CUC	*Cuculus canorus*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a
CUC	*Cuculus canorus*	Albacete	Spain	1	Lozano, 2008
CUC	*Cuculus canorus*	Albacete	Spain	1	Domínguez, 2008
CUC	*Geococcyx californianus*	Col de Tehachapi	USA	2	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
NOC	*Asio flammeus*	McBride Lake (Alberta)	Canada	2	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
NOC	*Asio flammeus*	Álava	Spain	1	Onrubia *et al.*, 2003.
NOC	*Asio flammeus*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Asio flammeus*	Nine Canyon (Wyoming)	USA	1	Erickson *et al.*, 2003. En: Kingsley y Whittam, 2007.
NOC	*Asio otus*	Col de Tehachapi	USA	1	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
NOC	*Athene cunicularia*	Puerto de Altamont	USA	27	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Athene cunicularia*	Puerto de Altamont	USA	4	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
NOC	*Athene cunicularia*	Puerto de Altamont	USA	70	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
NOC	*Athene cunicularia*	San Gorgonio	USA	1	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
NOC	*Bubo bubo*	Baden-Wurttemberg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
NOC	*Bubo bubo*	Nordrhein-Westfalen	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
NOC	*Bubo bubo*	E3	Spain	2	Marti y Barrios, 1995.
NOC	*Bubo bubo*	Navarra	Spain	1	Lekuona, 2001.
NOC	*Bubo bubo*	PESUR	Spain	2	Marti y Barrios, 1995.
NOC	*Bubo bubo*	Salajones	Spain	1	Lekuona, 2001.
NOC	*Bubo bubo*	Cádiz	Spain	1	Cruz, 2009
NOC	*Bubo bubo*	Guadalajara	Spain	1	Ruiz, 2008b.
NOC	*Bubo bubo*	Albacete	Spain	1	García, 2008
NOC	*Bubo bubo*	Albacete	Spain	1	Capilla Folgado *et al.*, 2008b
NOC	*Bubo bubo*	Albacete	Spain	1	Vázquez, 2004
NOC	*Bubo bubo*	Albacete	Spain	1	Vázquez, 2004
NOC	*Bubo bubo*	Albacete	Spain	1	Martínez, 2008
NOC	*Bubo bubo*	Aragón	Spain	1	Pelayo *et al.*, 2001
NOC	*Bubo virginianus*	Col de Tehachapi	USA	10	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
NOC	*Bubo virginianus*	Montezuma Hills	USA	2	Howell et Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
NOC	*Bubo virginianus*	Puerto de Altamont	USA	7	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Bubo virginianus*	Puerto de Altamont	USA	18	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
NOC	Búho no identificado	Puerto de Altamont	USA	10	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Chordeiles minor*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Otus flammeolus*	Col de Tehachapi	USA	1	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
NOC	*Otus scopus*	Albacete	Spain	1	Mariño, 2007
NOC	*Phalaenoptilus nutallii*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Strix aluco*	Cádiz	Spain	1	Lobón y Villar, 2009a
NOC	*Tyto alba*	Col de Tehachapi	USA	2	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
NOC	*Tyto alba*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
NOC	*Tyto alba*	Puerto de Altamont	USA	4	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
NOC	*Tyto alba*	Puerto de Altamont	USA	25	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
NOC	*Tyto alba*	Puerto de Altamont	USA	50	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
NOC	*Tyto alba*	Cádiz	Spain	1	Lobón y Villar, 2009f
NOC	*Tyto alba*	Cádiz	Spain	1	Muñoz, 2008p
NOC	*Tyto alba*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
NOC	*Tyto alba*	Burgos	Spain	1	
VEN	*Apus apus*	Brandenburg	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
VEN	*Apus apus*	Brandenburg	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
VEN	*Apus apus*	Sachsen-Anhalt	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
VEN	*Apus apus*	Sachsen-Anhalt	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
VEN	*Apus apus*	Álava	Spain	1	Onrubia *et al.*, 2001.
VEN	*Apus apus*	Elgea-Urkilla	Spain	1	Onrubia *et al.*, 2004.
VEN	*Apus apus*	Elgea-Urkilla	Spain	2	Onrubia *et al.*, 2005.
VEN	*Apus apus*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
VEN	*Apus apus*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
VEN	*Apus apus*	Guipúzcoa-Álava	Spain	2	Onrubia *et al.*, 2005.
VEN	*Apus apus*	Guipúzcoa-Álava	Spain	1	Onrubia *et al.*, 2004.
VEN	*Apus apus*	Izco	Spain	1	Lekuona, 2001.
VEN	*Apus apus*	Navarra	Spain	1	Lekuona, 2001.
VEN	*Apus apus*	Soria	Spain	1	Portulano, 2006b.

VEN	*Apus apus*	Soria	Spain	1	Portulano, 2007.
VEN	*Apus apus*	Soria	Spain	5	Portulano, 2006c.
VEN	*Apus apus*	Soria	Spain	1	Biovent energía, s.a. 2007a.
VEN	*Apus apus*	Soria	Spain	1	Biovent energía, s.a. 2007b.
VEN	*Apus apus*	Soria	Spain	1	Biovent energía, s.a. 2007c.
VEN	*Apus apus*	Soria	Spain	2	Biovent energía, s.a. 2006a.
VEN	*Apus apus*	Soria	Spain	1	Biovent energía, s.a. 2006b.
VEN	*Apus apus*	Barrage de l'Est, Zeebrugge	Netherlands	2	Everaert *et al*., 2002.
PIC	*Colaptes auratus*	rivière Castle (Alberta)	Canada	1	Brown, comm. pers. En: Kingsley y Whittam, 2007.
PIC	*Colaptes auratus*	Col de Tehachapi	USA	3	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PIC	*Colaptes auratus*	Montezuma Hills	USA	1	Howell et Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
PIC	*Colaptes auratus*	Puerto de Altamont	USA	6	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
PIC	*Colaptes auratus*	Stateline (Oregon)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PIC	*Dendrocopos major*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PIC	*Jinx torquilla*	Albacete	Spain	1	Torralba, 2005
PIC	*Melanerpes lewis*	Vansycle (Oregon)	USA	1	Strickland *et al*., 2000b. En: Kingsley y Whittam, 2007.
PIC	*Sphyrapicus varius*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Acrocephalus arundinaceus*	Albacete	Spain	1	Martínez, 2008
PAS	*Acrocephalus palustris*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Acrocephalus scirpaceus*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2007b
PAS	*Acrocephalus scirpaceus*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b
PAS	*Acrocephalus scirpaceus*	Cádiz	Spain	1	Muñoz, 2008e
PAS	*Acrocephalus scirpaceus*	Albacete	Spain	2	Cañizares, 2003
PAS	*Acrocephalus scirpaceus*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
PAS	*Acrocephalus scirpaceus*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Acrocephalus scirpaceus*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Acrocephalus scirpaceus*	Albacete	Spain	1	Vázquez, 2004
PAS	*Acrocephalus scirpaceus*	Albacete	Spain	1	González, 2006c
PAS	*Acrocephalus scirpaceus*	Aragón	Spain	1	Pelayo *et al*., 2001
PAS	*Acrocephalus scirpaceus*	Aragón	Spain	1	Sampietro *et al*., 2010
PAS	*Aeronautes saxatalis*	Ponnequin (Colorado)	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Aeronautes saxatalis*	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Aeronautes saxatalis*	Vansycle (Oregon)	USA	1	Strickland *et al*., 2000b. En: Kingsley y Whittam, 2007.
PAS	*Agelaius phoeniceus*	Rivière Castle (Alberta)	Canada	1	Brown, comm. pers. En: Kingsley y Whittam, 2007.
PAS	*Agelaius phoeniceus*	Montezuma Hills	USA	2	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
PAS	*Agelaius phoeniceus*	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Agelaius phoeniceus*	Puerto de Altamont	USA	12	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Agelaius phoeniceus*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Agelaius phoeniceus*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Agelaius tricolor*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Alauda arvensis*	Brandenburg	Germany	4	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Alauda arvensis*	Álava	Spain	10	Onrubia *et al*., 2003.
PAS	*Alauda arvensis*	Álava	Spain	6	Onrubia *et al*., 2001
PAS	*Alauda arvensis*	El Perdon	Spain	2	Lekuona, 2001.
PAS	*Alauda arvensis*	Elgea-Urkilla	Spain	5	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Alauda arvensis*	Elgea-Urkilla	Spain	6	Consultora de Recursos Naturales S.L., 2006.
PAS	*Alauda arvensis*	Elgea-Urkilla	Spain	7	Onrubia *et al*,. 2005.
PAS	*Alauda arvensis*	Guipúzcoa-Álava	Spain	5	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Alauda arvensis*	Guipúzcoa-Álava	Spain	6	Consultora de Recursos Naturales S.L., 2006
PAS	*Alauda arvensis*	Guipúzcoa-Álava	Spain	7	Onrubia *et al*., 200
PAS	*Alauda arvensis*	Guipúzcoa-Álava	Spain	6	Onrubia *et al*., 2004
PAS	*Alauda arvensis*	Navarra	Spain	2	Lekuona, 2001
PAS	*Alauda arvensis*	Soria	Spain	1	Portulano, 2006b
PAS	*Alauda arvensis*	Soria	Spain	4	Portulano, 2006a
PAS	*Alauda arvensis*	Soria	Spain	1	Portulano, 2007
PAS	*Alauda arvensis*	Soria	Spain	1	Biovent energía, s.a. 2007g
PAS	*Alauda arvensis*	Vizkaya	Spain	3	Unamuno *et al*., 2005
PAS	*Alauda arvensis*	Vizkaya	Spain	1	Unamuno *et al*., 2006
PAS	*Alauda arvensis*	Aragón	Spain	1	Icarus, 2006
PAS	*Alauda arvensis*	Aragón	Spain	1	Saenz, 2003
PAS	*Alauda arvensis*	Burgos	Spain	1	Eyser
PAS	*Alauda arvensis*	Burgos	Spain	1	Eyser
PAS	*Alauda arvensis*	Burgos	Spain	2	EOS Ingeniería y Consultoría Ambiental
PAS	*Alauda arvensis*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
PAS	*Alauda arvensis*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
PAS	*Alauda arvensis*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
PAS	*Alauda arvensis*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
PAS	*Alauda arvensis*	Burgos	Spain	1	
PAS	*Alauda arvensis*	Burgos	Spain	1	
PAS	*Alauda arvensis*	Burgos	Spain	1	
PAS	*Alaudido indeterminado*	Aragón	Spain	1	Oper, 2005g
PAS	*Alaudido indeterminado*	Aragón	Spain	3	Pelayo *et al*., 2001c
PAS	*Alaudido indeterminado*	Aragón	Spain	1	Faci, 2004b
PAS	*Alaudido indeterminado*	Aragón	Spain	1	Oper, 2006c
PAS	*Alaudido indeterminado*	Aragón	Spain	1	Oper, 2005f

PAS	*Ammodramus savannarum*	Stateline (Oregon)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Anthus campestris*	Guennda	Spain	2	Lekuona, 2001
PAS	*Anthus campestris*	Navarra	Spain	2	Lekuona, 2001
PAS	*Anthus campestris*	Soria	Spain	1	Portulano, 2006c
PAS	*Anthus campestris*	Guadalajara	Spain	1	Ruiz, 2008a
PAS	*Anthus campestris*	Guadalajara	Spain	1	Merchén, 2008b
PAS	*Anthus campestris*	Guadalajara	Spain	1	Gutiérrez, 2008a
PAS	*Anthus campestris*	Albacete	Spain	2	Cañizares, 2003
PAS	*Anthus campestris*	Albacete	Spain	1	Torralba, 2005
PAS	*Anthus campestris*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Anthus campestris*	Albacete	Spain	1	Vázquez y Uña, 2005
PAS	*Anthus campestris*	Albacete	Spain	1	Martínez-Acacio, 2005b
PAS	*Anthus campestris*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Anthus campestris*	Aragón	Spain	1	Oper, 2005b
PAS	*Anthus campestris*	Aragón	Spain	1	Oper, 2005c
PAS	*Anthus campestris*	Aragón	Spain	2	Oper, 2006a
PAS	*Anthus campestris*	Aragón	Spain	2	Oper, 2004d
PAS	*Anthus campestris*	Aragón	Spain	1	Oper, 2005e
PAS	*Anthus pratensis*	Álava	Spain	1	Onrubia *et al*., 2003.
PAS	*Anthus pratensis*	Elgea-Urkilla	Spain	2	Consultora de Recursos Naturales S.L., 2006.
PAS	*Anthus pratensis*	Elgea-Urkilla	Spain	2	Onrubia *et al*., 2005.
PAS	*Anthus pratensis*	Guipúzcoa-Álava	Spain	2	Consultora de Recursos Naturales S.L., 2006.
PAS	*Anthus pratensis*	Guipúzcoa-Álava	Spain	2	Onrubia *et al*., 2005.
PAS	*Anthus pratensis*	Soria	Spain	2	Portulano, 2006b.
PAS	*Anthus pratensis*	Soria	Spain	1	Portulano, 2006c.
PAS	*Anthus pratensis*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R., 2006.
PAS	*Anthus pratensis*	Vizkaya	Spain	1	Unamuno *et al*., 2006.
PAS	*Anthus rubescens*	Foote Creek Rim	USA	1	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Anthus rubescens*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997 . En: Kingsley y Whittam, 2007.
PAS	*Anthus rubescens*	Stateline (Washington)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Anthus spinoletta*	Álava	Spain	1	Onrubia *et al*., 2001.
PAS	*Anthus spinoletta*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2006.
PAS	*Anthus spinoletta*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Anthus spinoletta*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Anthus spinoletta*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2006.
PAS	*Anthus spinoletta*	Soria	Spain	1	Portulano, 2006b.
PAS	*Anthus trivialis*	Soria	Spain	1	Portulano, 2006c.
PAS	*Anthus trivialis*	Soria	Spain	1	Portulano, 2006c.
PAS	*Anthus trivialis*	Cádiz	Spain	1	Clemente, 2009b
PAS	*Aphelocoma californica*	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Calamospiza melanocorys*	Foote Creek Rim	USA	1	Johnson *et al*., 2001.
PAS	*Calcarius mccownii*	Ponnequin (Colorado)	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Carduelis cannabina*	Soria	Spain	1	Biovent energía, s.a. 2006b.
PAS	*Carduelis cannabina*	El Perdon	Spain	3	Lekuona, 2001.
PAS	*Carduelis cannabina*	Navarra	Spain	3	Lekuona, 2001.
PAS	*Carduelis carduelis*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2005.
PAS	*Carduelis carduelis*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2005.
PAS	*Carduelis carduelis*	Cádiz	Spain	1	Muñoz, 2008c
PAS	*Carduelis carduelis*	Cádiz	Spain	2	Muñoz, 2008d
PAS	*Carduelis carduelis*	Cádiz	Spain	1	Muñoz *et al*. 2009
PAS	*Carduelis carduelis*	Cádiz	Spain	2	Muñoz, 2008i
PAS	*Carduelis carduelis*	Cádiz	Spain	2	Muñoz, 2008m
PAS	*Carduelis chloris*	Brandenburg	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Carduelis tristis*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Carpodacus mexicanus*	Puerto de Altamont	USA	3	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Carpodacus mexicanus*	Puerto de Altamont	USA	18	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Carpodacus mexicanus*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Catharus fuscescens*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Catharus guttatus*	Foote Creek Rim	USA	1	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Catharus ustulatus*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Certhia americana*	Foote Creek Rim	USA	2	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Chaetura pelagica*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Chersophilus duponti*	Aragón	Spain		Oper, 2004g
PAS	*Cisticola juncidis*	Cádiz	Spain	1	Muñoz, 2008g
PAS	*Cistothorus platensis*	Buffalo Ridge	USA	2	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
PAS	Córvido no identificado	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	Córvido no identificado	Aragón	Spain	1	Oper, 2006d
PAS	*Corvus brachyrhynchos*	Puerto de Altamont	USA	7	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Corvus corax*	Brandenburg	Germany	3	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Corvus corax*	Col de Tehachapi	USA	3	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Corvus corax*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
PAS	*Corvus corax*	Puerto de Altamont	USA	12	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Corvus corax*	Puerto de Altamont	USA	9	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.

PAS	*Corvus corax*	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Corvus corax*	Burgos	Spain	1	EOS Ingeniería y Consultoría Ambiental
PAS	*Corvus corax*	Burgos	Spain	1	Testa
PAS	*Corvus corone*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Corvus corone*	Hessen, BW	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Corvus corone*	Vizkaya	Spain	1	Unamuno *et al*., 2006.
PAS	*Corvus corone*	Guadalajara	Spain	1	Parra, 2008a
PAS	*Corvus corone*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Corvus corone*	Albacete	Spain	1	Capilla Folgado *et al*., 2007b
PAS	*Corvus corone*	Albacete	Spain	1	Cañizares, 2005
PAS	*Corvus corone*	Albacete	Spain	1	Cañizares, 2006
PAS	*Corvus corone*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Corvus corone*	Albacete	Spain	1	Vázquez, 2005
PAS	*Corvus corone*	Albacete	Spain	1	González, 2006c
PAS	*Corvus corone*	Burgos	Spain		Eyser
PAS	*Corvus frugilegus*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Corvus monedula*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Corvus monedula*	Albacete	Spain	8	Cañizares, 2008e
PAS	*Cyanopica cyana*	Albacete	Spain	1	González y Lozano, 2004
PAS	*Delichon urbicum*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Delichon urbicum*	Guennda	Spain	1	Lekuona, 2001.
PAS	*Delichon urbicum*	Soria	Spain	2	Portulano, 2006b.
PAS	*Delichon urbicum*	Soria	Spain	1	Portulano, 2006c.
PAS	*Delichon urbicum*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Delichon urbicum*	Cádiz	Spain	1	Lobón y Villar, 2009b
PAS	*Delichon urbicum*	Cádiz	Spain	1	Muñoz, 2008k
PAS	*Delichon urbicum*	Cádiz	Spain	1	Serrano, 2009
PAS	*Delichon urbicum*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
PAS	*Delichon urbicum*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Delichon urbicum*	Albacete	Spain	1	Vázquez, 2004
PAS	*Delichon urbicum*	Albacete	Spain	1	Vázquez, 2005
PAS	*Delichon urbicum*	Albacete	Spain	1	Lozano, 2008
PAS	*Dendroica caerulescens*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica coronata*	Rivière Castle (Alberta)	Canada	1	Brown, comm. pers. En: Kingsley y Whittam, 2007.
PAS	*Dendroica coronata*	Buffalo Ridge	USA	1	Johnson *et al*., 2001.
PAS	*Dendroica coronata*	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Dendroica coronata*	Foote Creek Rim	USA	1	Johnson *et al*., 2001.
PAS	*Dendroica coronata*	Nine Canyon (Washington)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Dendroica coronata*	Puerto de Solano	USA	1	Bryne, 1983. En: Kingsley y Whittam, 2007.
PAS	*Dendroica coronata*	Stateline (Oregon)	USA	3	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica coronata*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica magnolia*	Buffalo Ridge	USA	1	Johnson *et al*., 2002.
PAS	*Dendroica magnolia*	Mountaineer	USA	5	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica nigrescens*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica nigrescens*	Puerto de Altamont	USA	1	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Dendroica pensylvanica*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica petechia*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica striata*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
PAS	*Dendroica striata*	Mountaineer	USA	3	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dendroica townsendi*	Foote Creek Rim	USA	3	Johnson *et al*., 2001.
PAS	*Dendroica townsendi*	Puerto de Altamont	USA	1	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Dendroica townsendi*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Dumetella carolinensis*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
PAS	Emberícido sin identificar	Alberta — rivière Castle	Canada	1	Brown et Hamilton, 2002. En: Kingsley y Whittam, 2007.
PAS	Emberícido sin identificar	McBride Lake (Alberta)	Canada	3	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
PAS	Emberícido sin identificar	Rivière Castle (Alberta)	Canada	2	Brown, comm. pers. En: Kingsley y Whittam, 2007.
PAS	Emberícido sin identificar	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	Emberícido sin identificar	Stateline (Oregon)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	Emberícido sin identificar	Vansycle (Oregon)	USA	1	Strickland *et al*., 2000b. En: Kingsley y Whittam, 2007.
PAS	*Emberiza calandra*	Brandenburg	Germany	9	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Emberiza calandra*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Emberiza calandra*	Albacete	Spain	2	Cañizares, 2008e
PAS	*Emberiza calandra*	Albacete	Spain	6	Cañizares, 2008e
PAS	*Emberiza calandra*	Cádiz	Spain	5	Muñoz, 2008b.
PAS	*Emberiza calandra*	Cádiz	Spain	2	Muñoz, 2008c.
PAS	*Emberiza calandra*	Cádiz	Spain	1	Muñoz, 2008d.
PAS	*Emberiza calandra*	Cádiz	Spain	2	Muñoz, 2008e.
PAS	*Emberiza calandra*	Cádiz	Spain	9	Muñoz, 2008e.
PAS	*Emberiza calandra*	Cádiz	Spain	1	Muñoz *et al*. 2009
PAS	*Emberiza calandra*	Cádiz	Spain	1	Muñoz *et al*. 2009
PAS	*Emberiza calandra*	Cádiz	Spain	4	Muñoz, 2008g.
PAS	*Emberiza calandra*	Cádiz	Spain	2	Muñoz, 2008h.
PAS	*Emberiza calandra*	Cádiz	Spain	1	Muñoz, 2008i.
PAS	*Emberiza calandra*	Cádiz	Spain	7	Muñoz, 2008j.
PAS	*Emberiza calandra*	Cádiz	Spain	5	Muñoz, 2008k.

PAS	*Emberiza calandra*	Cádiz	Spain	2	Muñoz, 2008l.
PAS	*Emberiza calandra*	Cádiz	Spain	5	Muñoz, 2008m.
PAS	*Emberiza calandra*	Cádiz	Spain	3	Muñoz, 2008n.
PAS	*Emberiza calandra*	Cádiz	Spain	3	Muñoz, 2008o.
PAS	*Emberiza calandra*	Cádiz	Spain	1	Lobón y Villar, 2009f.
PAS	*Emberiza calandra*	Cádiz	Spain	2	Muñoz, 2008p.
PAS	*Emberiza calandra*	Cádiz	Spain	4	Fernández, 2009a.
PAS	*Emberiza calandra*	Cádiz	Spain	2	Fernández, 2008b 2009b.
PAS	*Emberiza calandra*	Cádiz	Spain	6	Lazo *et al*., 2008.
PAS	*Emberiza calandra*	Guadalajara	Spain	1	Anónimo, 2008
PAS	*Emberiza calandra*	Guadalajara	Spain	1	Anónimo, 2008
PAS	*Emberiza calandra*	Guadalajara	Spain	2	Merchén, 2008b
PAS	*Emberiza calandra*	Guadalajara	Spain	2	Ruiz, 2008c.
PAS	*Emberiza calandra*	Albacete	Spain	3	Cañizares, 2003.
PAS	*Emberiza calandra*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
PAS	*Emberiza calandra*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
PAS	*Emberiza calandra*	Albacete	Spain	2	Mariño, 2007.
PAS	*Emberiza calandra*	Albacete	Spain	6	Cañizares y Torralba, 2004
PAS	*Emberiza calandra*	Albacete	Spain	1	Torralba, 2005.
PAS	*Emberiza calandra*	Albacete	Spain	2	Cañizares, 2006
PAS	*Emberiza calandra*	Albacete	Spain	1	Cañizares, 2007.
PAS	*Emberiza calandra*	Albacete	Spain	1	Capilla Folgado *et al*., 2007b
PAS	*Emberiza calandra*	Albacete	Spain	1	Capilla Folgado *et al*., 2007c
PAS	*Emberiza calandra*	Albacete	Spain	2	Vázquez, 2004
PAS	*Emberiza calandra*	Albacete	Spain	3	Vázquez, 2004
PAS	*Emberiza calandra*	Albacete	Spain	2	Vázquez, 2005
PAS	*Emberiza calandra*	Albacete	Spain	1	Lozano, 2006
PAS	*Emberiza calandra*	Albacete	Spain	1	González, 2006b
PAS	*Emberiza calandra*	Albacete	Spain	1	González, 2006c
PAS	*Emberiza calandra*	Albacete	Spain	3	Lozano, 2008
PAS	*Emberiza calandra*	Albacete	Spain	2	Fernández y Cañizares, 2001
PAS	*Emberiza calandra*	Albacete	Spain	3	Cañizares y Tortosa, 2003
PAS	*Emberiza calandra*	Albacete	Spain	1	Tortosa, 2004
PAS	*Emberiza calandra*	Aragón	Spain	1	Pelayo *et al*., 2001a
PAS	*Emberiza calandra*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2005a
PAS	*Emberiza calandra*	Aragón	Spain	1	Antón, 2005a
PAS	*Emberiza calandra*	Aragón	Spain	1	Sampietro *et al*., 2001
PAS	*Emberiza calandra*	Aragón	Spain	1	Rivas *et al*., 2003
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2004a
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2005b
PAS	*Emberiza calandra*	Aragón	Spain	3	Oper, 2004b
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2005c
PAS	*Emberiza calandra*	Aragón	Spain	3	Oper, 2006a
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2004c
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2005d
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2004d
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2005e
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2006b
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2004e
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2004f
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2005f
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2004g
PAS	*Emberiza calandra*	Aragón	Spain	3	Oper, 2005h
PAS	*Emberiza calandra*	Aragón	Spain	1	Oper, 2006d
PAS	*Emberiza calandra*	Aragón	Spain	1	Icarus, 2006
PAS	*Emberiza calandra*	Aragón	Spain	2	Oper, 2005g
PAS	*Emberiza cia*	Albacete	Spain	1	Tortosa, 2005.
PAS	*Emberiza cia*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Emberiza cia*	Albacete	Spain	1	Vázquez, 2003
PAS	*Emberiza cia*	Albacete	Spain	2	Tortosa, 2004
PAS	*Emberiza cia*	Aragón	Spain	2	Pelayo *et al*., 2001
PAS	*Emberiza cia*	Aragón	Spain	1	Pelayo *et al*., 2001a
PAS	*Emberiza cia*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Emberiza cia*	Aragón	Spain	1	Oper, 2005a
PAS	*Emberiza cia*	Aragón	Spain	1	Oper, 2004b
PAS	*Emberiza cia*	Aragón	Spain	1	Oper, 2006a
PAS	*Emberiza cia*	Aragón	Spain	1	Oper, 2005e
PAS	*Emberiza cia*	Aragón	Spain	1	Oper, 2006
PAS	*Emberiza cirlus*	Aragón	Spain	1	Pelayo *et al*., 2001a
PAS	*Emberiza cirlus*	Aragón	Spain	4	Pelayo *et al*., 2002
PAS	*Emberiza citrinella*	Álava	Spain	1	Onrubia *et al*., 2003.
PAS	*Emberiza citrinella*	Albacete	Spain	1	González y Tortosa, 2006.
PAS	*Emberiza citrinella*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Emberiza citrinella*	Albacete	Spain	1	Tortosa, 2004
PAS	*Emberiza citrinella*	Aragón	Spain	1	Icarus, 2006
PAS	*Emberiza citrinella*	Burgos	Spain	1	EIN Castilla La Mancha, 2005a.
PAS	*Emberiza schoeniclus*	Guadalajara	Spain	2	EIN Castilla La Mancha, 2005b.
PAS	*Emberiza schoeniclus*	Guadalajara	Spain	1	

PAS	*Empidonax difficilis*	Puerto de Altamont	USA	1	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Empidonax minimus*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	McBride Lake (Alberta)	Canada	4	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Col de Tehachapi	USA	2	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Foote Creek Rim	USA	28	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Nine Canyon (Washington)	USA	17	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Ponnequin (Colorado)	USA	5	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Puerto de Altamont	USA	23	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Puerto de Altamont	USA	5	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Puerto de Altamont	USA	14	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Stateline (Oregon)	USA	48	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Stateline (Washington)	USA	33	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Vansycle (Oregon)	USA	1	Strickland *et al*., 2000b. En: Kingsley y Whittam, 2007.
PAS	*Eremophila alpestris*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Erithacus rubecula*	Álava	Spain	3	Onrubia *et al*., 2003.
PAS	*Erithacus rubecula*	Elgea-Urkilla	Spain	2	Onrubia *et al*., 2004.
PAS	*Erithacus rubecula*	Elgea-Urkilla	Spain	5	Onrubia *et al*., 2005.
PAS	*Erithacus rubecula*	Guipúzcoa-Álava	Spain	5	Onrubia *et al*., 2005.
PAS	*Erithacus rubecula*	Guipúzcoa-Álava	Spain	2	Onrubia *et al*., 2004.
PAS	*Erithacus rubecula*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Erithacus rubecula*	Navarra	Spain	2	Lekuona, 2001.
PAS	*Erithacus rubecula*	Navarra	Spain	3	Lekuona, 2001.
PAS	*Erithacus rubecula*	Soria	Spain	3	Portulano, 2006a.
PAS	*Erithacus rubecula*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2002.
PAS	*Erithacus rubecula*	Albacete	Spain	1	Tortosa, 2004
PAS	*Erithacus rubecula*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a.
PAS	*Erithacus rubecula*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005b.
PAS	*Erithacus rubecula*	Guadalajara	Spain	2	Herranz, 2006.
PAS	*Erithacus rubecula*	Guadalajara	Spain	1	Anónimo, 2008
PAS	*Erithacus rubecula*	Guadalajara	Spain	2	Gutiérrez, 2008a
PAS	*Erithacus rubecula*	Albacete	Spain	2	*Ovidio et al., 2006*
PAS	*Erithacus rubecula*	Albacete	Spain	4	Cañizares, 2003.
PAS	*Erithacus rubecula*	Albacete	Spain	2	Martínez-Acacio, 2004.
PAS	*Erithacus rubecula*	Albacete	Spain	1	Cañizares, 2004.
PAS	*Erithacus rubecula*	Albacete	Spain	1	Tortosa y Cañizares, 2003
PAS	*Erithacus rubecula*	Albacete	Spain	1	Tortosa, 2003b.
PAS	*Erithacus rubecula*	Albacete	Spain	1	Capilla Folgado *et al*., 2008b
PAS	*Erithacus rubecula*	Albacete	Spain	2	Gónzalez y Lozano, 2004
PAS	*Erithacus rubecula*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Erithacus rubecula*	Albacete	Spain	3	Cañizares, 2008e
PAS	*Erithacus rubecula*	Albacete	Spain	1	Martínez, 2008
PAS	*Erithacus rubecula*	Albacete	Spain	1	Vázquez, 2003
PAS	*Erithacus rubecula*	Albacete	Spain	1	Martínez-Acacio *et al*., 2007
PAS	*Erithacus rubecula*	Albacete	Spain	1	Lozano, 2008
PAS	*Erithacus rubecula*	Albacete	Spain	1	Cañizares y Tortosa, 2003
PAS	*Erithacus rubecula*	Aragón	Spain	1	Pelayo *et al*., 2001
PAS	*Erithacus rubecula*	Aragón	Spain	3	Pelayo *et al*., 2002
PAS	*Erithacus rubecula*	Aragón	Spain	1	Oper, 2005a
PAS	*Erithacus rubecula*	Aragón	Spain	1	Antón, 2006
PAS	*Erithacus rubecula*	Aragón	Spain	1	Faci, 2004
PAS	*Erithacus rubecula*	Aragón	Spain	1	Rivas *et al*., 2003
PAS	*Erithacus rubecula*	Aragón	Spain	1	Rivas *et al*., 2004
PAS	*Erithacus rubecula*	Aragón	Spain	1	Faci, 2005c
PAS	*Erithacus rubecula*	Burgos	Spain	2	Eyser, 2004. Parque Eólico la Magdalena
PAS	*Euphagus cyanocephalus*	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Euphagus cyanocephalus*	Puerto de Altamont	USA	13	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Euphagus cyanocephalus*	Puerto de Altamont	USA	8	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Ficedula hypoleuca*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007. , 2004
PAS	*Ficedula hypoleuca*	Álava	Spain	1	Onrubia *et al*., 2003.
PAS	*Ficedula hypoleuca*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2004.
PAS	*Ficedula hypoleuca*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2004.
PAS	*Ficedula hypoleuca*	Soria	Spain	1	Biovent energía, s.a. 2007a.
PAS	*Ficedula hypoleuca*	Guadalajara	Spain	2	EIN Castilla La Mancha, 2005a.
PAS	*Ficedula hypoleuca*	Guadalajara	Spain	1	Parra, 2008a.
PAS	*Ficedula hypoleuca*	Guadalajara	Spain	2	EIN Castilla La Mancha, 2005b.
PAS	*Ficedula hypoleuca*	Guadalajara	Spain	2	Merchén, 2008a
PAS	*Ficedula hypoleuca*	Guadalajara	Spain	2	Merchén, 2008b
PAS	*Ficedula hypoleuca*	Albacete	Spain	6	Cañizares, 2003.
PAS	*Ficedula hypoleuca*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
PAS	*Ficedula hypoleuca*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
PAS	*Ficedula hypoleuca*	Albacete	Spain	2	Gónzalez y Lozano, 2005
PAS	*Ficedula hypoleuca*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Ficedula hypoleuca*	Albacete	Spain	1	Vázquez, 2004
PAS	*Ficedula hypoleuca*	Albacete	Spain	2	Vázquez, 2005
PAS	*Ficedula hypoleuca*	Albacete	Spain	2	Lozano, 2006
PAS	*Ficedula hypoleuca*	Albacete	Spain	1	González, 2007
PAS	*Ficedula hypoleuca*	Albacete	Spain	1	Fernández y Cañizares, 2001

PAS	*Ficedula hypoleuca*	Albacete	Spain	1	Tortosa, 2004
PAS	*Ficedula hypoleuca*	Aragón	Spain	2	Pelayo *et al*, 1999
PAS	*Ficedula hypoleuca*	Aragón	Spain	2	Rivas *et al*., 2003
PAS	*Ficedula hypoleuca*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	Fringílido sin identificar	Soria	Spain	1	Biovent energía, s.a. 2007c.
PAS	*Fringilla coelebs*	Álava	Spain	2	Onrubia *et al*., 2003.
PAS	*Fringilla coelebs*	Izco	Spain	1	Lekuona, 2001.
PAS	*Fringilla coelebs*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Fringilla coelebs*	Soria	Spain	1	Portulano, 2007.
PAS	*Fringilla coelebs*	Guadalajara	Spain	1	López-Tello, 2006
PAS	*Fringilla coelebs*	Guadalajara	Spain	1	Ruiz, 2008a
PAS	*Fringilla coelebs*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
PAS	*Fringilla coelebs*	Albacete	Spain	1	Cañizares, 2005
PAS	*Fringilla coelebs*	Albacete	Spain	1	Cañizares, 2006
PAS	*Fringilla coelebs*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Fringilla coelebs*	Albacete	Spain	1	Lozano, 2006
PAS	*Fringilla coelebs*	Albacete	Spain	1	Martínez, 2008
PAS	*Fringilla coelebs*	Albacete	Spain	1	Vázquez, 2003
PAS	*Fringilla coelebs*	Aragón	Spain	2	Pelayo *et al*., 2001a
PAS	*Fringilla coelebs*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Fringilla coelebs*	Aragón	Spain	1	Antón, 2006
PAS	*Galerida cristata*	Navarra	Spain	1	Lekuona, 2001
PAS	*Galerida* sp.	Aragón	Spain	1	Rivas *et al*. 2004
PAS	*Galerida* sp.	Castilla-La Mancha	Spain	1	Informe anual nº 3 (enero-diciembre 2006). PVA
PAS	*Galerida theklae*	Soria	Spain	1	Portulano, 2006c
PAS	*Galerida theklae*	Cádiz	Spain	2	Lobón y Villar, 2009g
PAS	*Galerida theklae*	Guadalajara	Spain	1	Anónimo, 2008
PAS	*Galerida theklae*	Guadalajara	Spain	1	Parra, 2008c
PAS	*Galerida theklae*	Albacete	Spain	2	Erans y Domínguez, 2007a
PAS	*Galerida theklae*	Albacete	Spain	7	Cañizares, 2003.
PAS	*Galerida theklae*	Albacete	Spain	2	Martínez-Acacio, 2004.
PAS	*Galerida theklae*	Albacete	Spain	1	Martínez-Acacio, 2005a.
PAS	*Galerida theklae*	Albacete	Spain	1	Martínez-Acacio *et al*., 2004
PAS	*Galerida theklae*	Albacete	Spain	1	Tortosa y Cañizares, 2003
PAS	*Galerida theklae*	Albacete	Spain	1	Tortosa, 2003a
PAS	*Galerida theklae*	Albacete	Spain	1	González y Tortosa, 2006.
PAS	*Galerida theklae*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Galerida theklae*	Albacete	Spain	1	Torralba, 2005.
PAS	*Galerida theklae*	Albacete	Spain	1	Torralba, 2006.
PAS	*Galerida theklae*	Albacete	Spain	1	Domínguez y Erans, 2008
PAS	*Galerida theklae*	Albacete	Spain	1	Cañizares, 2008b
PAS	*Galerida theklae*	Albacete	Spain	1	Cañizares, 2008c
PAS	*Galerida theklae*	Albacete	Spain	3	Cañizares, 2006
PAS	*Galerida theklae*	Albacete	Spain	4	Cañizares, 2008d
PAS	*Galerida theklae*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Galerida theklae*	Albacete	Spain	6	Cañizares, 2008e
PAS	*Galerida theklae*	Albacete	Spain	2	Vázquez, 2004
PAS	*Galerida theklae*	Albacete	Spain	2	Vázquez, 2004
PAS	*Galerida theklae*	Albacete	Spain	1	Vázquez, 2005
PAS	*Galerida theklae*	Albacete	Spain	3	Lozano, 2006
PAS	*Galerida theklae*	Albacete	Spain	1	González, 2006b
PAS	*Galerida theklae*	Albacete	Spain	1	Martínez, 2008
PAS	*Galerida theklae*	Albacete	Spain	1	Vázquez, 2003
PAS	*Galerida theklae*	Albacete	Spain	1	Martínez-Acacio *et al*., 2007
PAS	*Galerida theklae*	Albacete	Spain	1	González, 2006c
PAS	*Galerida theklae*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Galerida theklae*	Albacete	Spain	5	Cañizares y Tortosa, 2003
PAS	*Galerida theklae*	Albacete	Spain	3	Tortosa, 2004
PAS	*Galerida theklae*	Aragón	Spain	1	Pelayo *et al*., 2001
PAS	*Galerida theklae*	Aragón	Spain	2	Pelayo *et al*., 2001a
PAS	*Galerida theklae*	Aragón	Spain	4	Pelayo *et al*., 2002
PAS	*Galerida theklae*	Aragón	Spain	1	Antón, 2005a
PAS	*Galerida theklae*	Aragón	Spain	1	Faci, 2005a
PAS	*Galerida theklae*	Aragón	Spain	3	Pelayo *et al*., 2001c
PAS	*Galerida theklae*	Aragón	Spain	1	Faci *et al*., 2003
PAS	*Galerida theklae*	Aragón	Spain	1	Faci, 2005b
PAS	*Galerida theklae*	Aragón	Spain	3	Faci, 2004b
PAS	*Galerida theklae*	Aragón	Spain	6	Rivas *et al*., 2003
PAS	*Galerida theklae*	Aragón	Spain	3	Rivas *et al*., 2004
PAS	*Galerida theklae*	Aragón	Spain	1	Icarus, 2005
PAS	*Galerida theklae*	Aragón	Spain	1	Oper, 2004b
PAS	*Galerida theklae*	Aragón	Spain	1	Oper, 2004c
PAS	*Galerida theklae*	Aragón	Spain	1	Oper, 2004d
PAS	*Galerida theklae*	Castilla-La Mancha	Spain	1	Informe anual nº 3 (enero-diciembre 2006). PVA PE Cristo de los Bailones
PAS	*Galerida theklae*	Albacete	Spain	4	Gónzalez y Lozano, 2005
PAS	*Garrulus glandarius*	Albacete	Spain	1	Martínez-Acacio, 2004.
PAS	*Garrulus glandarius*	Albacete	Spain	1	Tortosa y Cañizares, 2003
PAS	*Garrulus glandarius*	Albacete	Spain	2	González y Tortosa, 2006.

PAS	*Garrulus glandarius*	Albacete	Spain	1	Capilla Folgado *et al.*, 2007a
PAS	*Garrulus glandarius*	Albacete	Spain	1	Capilla Folgado *et al.*, 2008b
PAS	*Garrulus glandarius*	Albacete	Spain	1	Vázquez, 2004
PAS	*Garrulus glandarius*	Albacete	Spain	1	Domínguez, 2008
PAS	*Geothlypis trichas*	Buffalo Ridge	USA	7	Johnson *et al.*, 2002.
PAS	*Geothlypis trichas*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	Golondrina sin identificar	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Hippolais polyglotta*	Elgea-Urkilla	Spain	1	Onrubia *et al.*, 2004.
PAS	*Hippolais polyglotta*	Guipúzcoa-Álava	Spain	1	Onrubia *et al.*, 2004.
PAS	*Hippolais polyglotta*	Burgos	Spain	1	
PAS	*Hippolais polyglotta*	Aragón	Spain	1	Oper, 2005c.
PAS	*Hippolais polyglotta*	Albacete	Spain	4	Cañizares, 2003.
PAS	*Hippolais polyglotta*	Albacete	Spain	1	Fernández y Cañizares, 2001.
PAS	*Hirundo daurica*	Guadalajara	Spain	1	Ruiz, 2008a
PAS	*Hirundo pyrrhonota*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Hirundo pyrrhonota*	Puerto de Altamont	USA	5	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Hirundo pyrrhonota*	Puerto de Altamont	USA	2	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Hirundo pyrrhonota*	Puerto de Altamont	USA	3	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Hirundo rustica*	El Perdon	Spain	1	Lekuona, 2001.
PAS	*Hirundo rustica*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Hirundo rustica*	Buffalo Ridge	USA	1	Strickland *et al.*, 2000. En: Kingsley y Whittam, 2007.
PAS	*Hirundo rustica*	Buffalo Ridge	USA	4	Johnson *et al.*, 2002. En: Kingsley y Whittam, 2007.
PAS	*Hirundo rustica*	Wisconsin	USA	1	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Hirundo rustica*	Cádiz	Spain	1	Muñoz, 2008d
PAS	*Hirundo rustica*	Cádiz	Spain	1	Muñoz, 2008j
PAS	*Hirundo rustica*	Burgos	Spain	1	Parque eólico Lodoso, 2007
PAS	*Hirundo rustica*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Hirundo rustica*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Hirundo rustica*	Albacete	Spain	1	Vázquez, 2004
PAS	*Hirundo rustica*	Aragón	Spain	1	Pelayo *et al.*, 2002
PAS	*Hirundo rustica*	Aragón	Spain	1	Faci *et al.*, 2005
PAS	*Hirundo rustica*	Aragón	Spain	1	Rivas *et al.*, 2004
PAS	*Hylocichla mustelina*	Mountaineer	USA	3	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Junco hyemalis*	McBride Lake (Alberta)	Canada	2	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
PAS	*Junco hyemalis*	Col de Tehachapi	USA	1	Anderson *et al.*, 2000. En: Kingsley y Whittam, 2007.
PAS	*Junco hyemalis*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001.
PAS	*Junco hyemalis*	Klondike (Oregon)	USA	1	Johnson *et al.*, 2003.
PAS	*Junco hyemalis*	Stateline (Oregon)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Junco hyemalis*	Stateline (Washington)	USA	2	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Lanius collurio*	Soria	Spain	1	Portulano, 2006b.
PAS	*Lanius excubitor*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Lanius ludovicianus*	Puerto de Altamont	USA	1	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Lanius ludovicianus*	Puerto de Altamont	USA	5	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Lanius meridionalis*	Guadalajara	Spain	1	Ruiz, 2008c.
PAS	*Lanius meridionalis*	Albacete	Spain	1	Capilla Folgado *et al.*, 2006b
PAS	*Lanius meridionalis*	Albacete	Spain	1	Vázquez, 2005
PAS	*Lanius meridionalis*	Albacete	Spain	1	Lozano, 2008
PAS	*Lanius senator*	Cádiz	Spain	1	Muñoz, 2008b
PAS	*Lanius senator*	Cádiz	Spain	2	Muñoz, 2008e
PAS	*Lanius senator*	Albacete	Spain	2	Cañizares, 2003
PAS	*Lanius senator*	Albacete	Spain	2	Martínez-Acacio, 2005a
PAS	*Lanius senator*	Albacete	Spain	1	Torralba, 2004
PAS	*Lanius senator*	Albacete	Spain	1	Cañizares, 2006
PAS	*Lanius senator*	Albacete	Spain	1	Martínez, 2008
PAS	*Lanius senator*	Albacete	Spain	1	González, 2006c
PAS	*Lanius senator*	Aragón	Spain	3	Pelayo *et al.*, 2002
PAS	*Lanius senator*	Aragón	Spain	1	Gajón *et al.*, 2006a
PAS	*Lanius senator*	Aragón	Spain	1	Pelayo *et al.*, 2001b
PAS	*Locustella naevia*	Soria	Spain	1	Portulano, 2006c.
PAS	*Locustella naevia*	Guadalajara	Spain	1	Parra, 2008d
PAS	*Locustella naevia*	Albacete	Spain	2	Cañizares, 2003
PAS	*Loxia curvirostra*	Alaiz	Spain	1	Lekuona, 2001.
PAS	*Loxia curvirostra*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Loxia curvirostra*	Albacete	Spain	1	Córoles, 2008.
PAS	*Loxia curvirostra*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Loxia curvirostra*	Albacete	Spain	1	Martínez-Acacio, 2005a.
PAS	*Lullula arborea*	El Perdon	Spain	4	Lekuona, 2001
PAS	*Lullula arborea*	Guennda	Spain	1	Lekuona, 2001
PAS	*Lullula arborea*	Navarra	Spain	1	Lekuona, 2001
PAS	*Lullula arborea*	Navarra	Spain	4	Lekuona, 2001
PAS	*Lullula arborea*	Soria	Spain	1	Biovent energía, s.a. 2007a.
PAS	*Lullula arborea*	Soria	Spain	1	Biovent energía, s.a. 2007c.
PAS	*Lullula arborea*	Soria	Spain	1	Biovent energía, s.a. 2007e.
PAS 5	*Lullula arborea*	Castilla-La Mancha	Spain	1	Ingeniería y Ciencia Ambiental. S.L. 2008. Informe anual nº (enero-diciembre). PVA
PAS	*Lullula arborea*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a.
PAS	*Lullula arborea*	Guadalajara	Spain	1	Parra, 2008b.

PAS	*Lullula arborea*	Guadalajara	Spain	1	Merchén, 2008a
PAS	*Lullula arborea*	Guadalajara	Spain	5	Anónimo, 2008
PAS	*Lullula arborea*	Guadalajara	Spain	1	Parra, 2008c
PAS	*Lullula arborea*	Guadalajara	Spain	2	Gutiérrez, 2008a
PAS	*Lullula arborea*	Guadalajara	Spain	2	Merchen, 2008c
PAS	*Lullula arborea*	Albacete	Spain	1	*Ovidio et al., 2006*
PAS	*Lullula arborea*	Albacete	Spain	1	Martínez, 2006
PAS	*Lullula arborea*	Albacete	Spain	1	González, 2006a
PAS	*Lullula arborea*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Lullula arborea*	Albacete	Spain	3	Cañizares, 2005.
PAS	*Lullula arborea*	Albacete	Spain	1	González, 2006
PAS	*Lullula arborea*	Albacete	Spain	1	Cañizares, 2008b
PAS	*Lullula arborea*	Albacete	Spain	1	Capilla Folgado *et al.*, 2007c
PAS	*Lullula arborea*	Albacete	Spain	1	Torralba, 2004
PAS	*Lullula arborea*	Albacete	Spain	1	Lozano, 2006
PAS	*Lullula arborea*	Albacete	Spain	1	Martínez-Acacio, 2005b.
PAS	*Lullula arborea*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2007
PAS	*Lullula arborea*	Albacete	Spain	1	Cañizares y Tortosa, 2003
PAS	*Lullula arborea*	Aragón	Spain	2	Pelayo *et al.*, 2001a
PAS	*Lullula arborea*	Aragón	Spain	2	Pelayo *et al.*, 2002
PAS	*Lullula arborea*	Aragón	Spain	1	Faci, 2005a
PAS	*Lullula arborea*	Aragón	Spain	3	Oper, 2004
PAS	*Lullula arborea*	Aragón	Spain	2	Oper, 2005b
PAS	*Lullula arborea*	Aragón	Spain	1	Oper, 2004b
PAS	*Lullula arborea*	Aragón	Spain	1	Oper, 2004c
PAS	*Lullula arborea*	Aragón	Spain	1	Oper, 2005d
PAS	*Lullula arborea*	Aragón	Spain	2	Oper, 2004d
PAS	*Lullula arborea*	Aragón	Spain	2	Oper, 2006b
PAS	*Luscinia megarhynchos*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Luscinia megarhynchos*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Luscinia megarhynchos*	Albacete	Spain	1	González, 2006c
PAS	*Luscinia megarhynchos*	Albacete	Spain	2	Cañizares y Tortosa, 2003
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Muñoz, 2008c
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Muñoz, 2008f
PAS	*Melanocorhypa calandra*	Cádiz	Spain	2	Muñoz *et al.* 2009
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Muñoz *et al.* 2009
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Muñoz, 2008g
PAS	*Melanocorhypa calandra*	Cádiz	Spain	2	Muñoz, 2008k
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Muñoz, 2008l
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Fernández, 2008a
PAS	*Melanocorhypa calandra*	Cádiz	Spain	1	Fernández, 2008b
PAS	*Melanocorhypa calandra*	Cádiz	Spain	2	Fernández, 2009b
PAS	*Melanocorhypa calandra*	Albacete	Spain	6	Cañizares, 2003.
PAS	*Melanocorhypa calandra*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Melanocorhypa calandra*	Albacete	Spain	1	Domínguez y Erans, 2008
PAS	*Melanocorhypa calandra*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Melanocorhypa calandra*	Albacete	Spain	2	Cañizares, 2008e
PAS	*Melanocorhypa calandra*	Albacete	Spain	6	Cañizares, 2008e
PAS	*Melanocorhypa calandra*	Albacete	Spain	1	Lozano, 2006
PAS	*Melanocorhypa calandra*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Melanocorhypa calandra*	Albacete	Spain	1	Cañizares y Tortosa, 2003
PAS	*Melanocorhypa calandra*	Albacete	Spain	2	Tortosa, 2004
PAS	*Melanocorhypa calandra*	Aragón	Spain	1	Oper, 2005a
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Antón, 2005a
PAS	*Melanocorhypa calandra*	Aragón	Spain	1	Antón, 2006
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	EIN Castilla La Mancha, 2007
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Sampietro *et al.*, 2004
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Pelayo *et al.*, 2001b
PAS	*Melanocorhypa calandra*	Aragón	Spain	5	Faci, 2004b
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Faci *et al.*, 2005
PAS	*Melanocorhypa calandra*	Aragón	Spain	1	Oper, 2004a
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Oper, 2004b
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Oper, 2005c
PAS	*Melanocorhypa calandra*	Aragón	Spain	5	Oper, 2006a
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Oper, 2003
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Oper, 2004c
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Oper, 2005d
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Oper, 2004d
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Oper, 2005e
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Oper, 2006b
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Faci, 2005c
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Gajón *et al.*, 2006c
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Oper, 2004e
PAS	*Melanocorhypa calandra*	Aragón	Spain	3	Oper, 2006c
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Oper, 2004f
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Oper, 2005f
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Oper, 2004g
PAS	*Melanocorhypa calandra*	Aragón	Spain	4	Oper, 2005g
PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Oper, 2005h

PAS	*Melanocorhypa calandra*	Aragón	Spain	2	Oper, 2006d
PAS	*Melanocorhypa calandra*	Aragón	Spain	1	Icarus, 2006
PAS	*Melanocorhypa calandra*	Aragón	Spain	1	L'auca, 2006
PAS	*Melanocorhypa calandra*	Burgos	Spain	1	
PAS	*Melanocorhypa calandra*	Burgos	Spain	1	
PAS	*Melospiza georgiana*	Mountaineer	USA	1	Kerns et Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Melospiza lincolnii*	Buffalo Ridge	USA	1	Strickland et *al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Melospiza lincolnii*	Buffalo Ridge	USA	1	Johnson et *al*., 2002.
PAS	*Merops apiaster*	Cádiz	Spain	1	Serrano, 2009
PAS	*Merops apiaster*	Albacete	Spain	1	Capilla Folgado et *al*., 2008
PAS	*Merops apiaster*	Albacete	Spain	1	Martínez-Acacio, 2005b.
PAS	*Merops apiaster*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Merops apiaster*	Aragón	Spain	1	Pelayo et *al*., 2001
PAS	*Merops apiaster*	Aragón	Spain	1	Oper, 2006d
PAS	*Mimus polyglottos*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	Mirlo sin identificar	Foote Creek Rim	USA	2	Johnson et *al*., 2001.
PAS	Mirlo sin identificar	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	Mirlo sin identificar	Puerto de Altamont	USA	1	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Mniotilta varia*	Buffalo Ridge	USA	3	Johnson et *al*., 2002. En: Kingsley y Whittam, 2007.
PAS	*Molothrus ater*	Klondike (Oregon)	USA	1	Johnson et *al*., 2003.
PAS	*Molothrus ater*	Puerto de Altamont	USA	2	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	Mosquero sp.	Buffalo Ridge	USA	2	Johnson et *al*., 2002. En: Kingsley y Whittam, 2007.
PAS	*Motacilla alba*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Motacilla alba*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2006.
PAS	*Motacilla alba*	Elgea-Urkilla	Spain	1	Onrubia et *al*., 2004.
PAS	*Motacilla alba*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2006.
PAS	*Motacilla alba*	Guipúzcoa-Álava	Spain	1	Onrubia et *al*., 2004.
PAS	*Motacilla alba*	Vizkaya	Spain	1	Consultora de Recursos Naturales S.L., 2007c.
PAS	*Motacilla alba*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert et *al*., 2003.
PAS	*Motacilla alba*	Cádiz	Spain	1	Lobón y Villar, 2009a
PAS	*Motacilla alba*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Motacilla alba*	Albacete	Spain	11	Cañizares y Torralba, 2004
PAS	*Motacilla alba*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Motacilla alba*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Motacilla alba*	Aragón	Spain	1	Oper, 2005a
PAS	*Motacilla alba*	Aragón	Spain	1	Sampietro et *al*., 2006
PAS	*Motacilla alba*	Aragón	Spain	1	Rivas et *al*., 2003
PAS	*Motacilla alba*	Aragón	Spain	1	Oper, 2005c
PAS	*Motacilla flava*	Brandenburg	Germany	1	Durr, 2004.
PAS	*Motacilla flava*	Cádiz	Spain	1	Muñoz, 2008e
PAS	*Muscicapa striata*	Albacete	Spain	1	Lozano, 2006
PAS	*Myotis blythii*	Cádiz	Spain	1	Yarte, 2009
PAS	*Myotis blythii*	Albacete	Spain	1	González, 2006
PAS	*Nymphicus hollandicus*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Oenanthe hispanica*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Oenanthe hispanica*	Albacete	Spain	1	Martínez-Acacio, 2004
PAS	*Oenanthe hispanica*	Albacete	Spain	1	Cañizares, 2005
PAS	*Oenanthe hispanica*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Oenanthe hispanica*	Albacete	Spain	1	Vázquez, 2005
PAS	*Oenanthe hispanica*	Albacete	Spain	1	Vázquez, 2003
PAS	*Oenanthe hispanica*	Albacete	Spain	3	Fernández y Cañizares, 2001
PAS	*Oenanthe hispanica*	Albacete	Spain	7	Tortosa, 2004
PAS	*Oenanthe hispanica*	Aragón	Spain	1	Oper, 2005b
PAS	*Oenanthe hispanica*	Aragón	Spain	1	Oper, 2006a
PAS	*Oenanthe oenanthe*	Soria	Spain	2	Portulano, 2006b
PAS	*Oenanthe oenanthe*	Guadalajara	Spain	1	Parra, 2008a
PAS	*Oenanthe oenanthe*	Guadalajara	Spain	1	Anónimo, 2008
PAS	*Oenanthe oenanthe*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Oenanthe oenanthe*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Oenanthe sp*	Aragón	Spain	1	Pelayo et *al*., 2002
PAS	*Oporornis tolmiei*	Foote Creek Rim	USA	1	Johnson et *al*., 2001.
PAS	*Oporornis tolmiei*	Stateline (Oregon)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Oreoscoptes montanus*	Foote Creek Rim	USA	1	Johnson et *al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Parus caeruleus*	Aragón	Spain	1	Oper, 2005d
PAS	*Parus caeruleus*	Aragón	Spain	1	Oper, 2004d
PAS	*Parus caeruleus*	Aragón	Spain	1	Oper, 2005e
PAS	*Parus major*	Brandenburg	Germany	1	Durr, 2004 . En: Kingsley y Whittam, 2007.
PAS	*Parus major*	Guadalajara	Spain	1	Ruiz, 2008b
PAS	*Parus major*	Albacete	Spain	1	Cañizares, 2003
PAS	*Parus major*	Albacete	Spain	1	Erans et *al*., 2008
PAS	Paseriforme sin identificar	McBride Lake (Alberta)	Canada	6	Brown et Hamilton, 2004. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Rivière Castle (Alberta)	Canada	1	Brown, comm. pers. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Soria	Spain	1	Biovent energía, s.a. 2007b.
PAS	Paseriforme sin identificar	Soria	Spain	1	Biovent energía, s.a. 2007c.
PAS	Paseriforme sin identificar	Soria	Spain	1	Biovent energía, s.a. 2006b.
PAS	Paseriforme sin identificar	Soria	Spain	1	Grupo I 2007 (informe 2° semestre de 2006).
PAS	Paseriforme sin identificar	Buffalo Ridge	USA	1	Johnson et *al*., 2002.
PAS	Paseriforme sin identificar	Col de Tehachapi	USA	16	Anderson et *al*., 2000. En: Kingsley y Whittam, 2007.

PAS	Paseriforme sin identificar	Col de Tehachapi	USA	4	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Foote Creek Rim	USA	5	Johnson *et al*., 2001.
PAS	Paseriforme sin identificar	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Mountaineer	USA	9	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Nine Canyon (Washington)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Puerto de Altamont	USA	16	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Puerto de Altamont	USA	29	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Puerto de Altamont	USA	16	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Puerto de Altamont	USA	11	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Puerto de Altamont	USA	42	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	San Gorgonio	USA	9	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Stateline (Oregon)	USA	3	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Stateline (Washington)	USA	4	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	Paseriforme sin identificar	Vansycle (Oregon)	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Passer domesticus*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passer domesticus*	Buffalo Ridge	USA	1	Johnson *et al*., 2002.
PAS	*Passer domesticus*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passer domesticus*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passer domesticus*	Cádiz	Spain	1	Muñoz, 2008a.
PAS	*Passer domesticus*	Cádiz	Spain	2	Muñoz, 2008b
PAS	*Passer domesticus*	Cádiz	Spain	10	Muñoz, 2008c
PAS	*Passer domesticus*	Cádiz	Spain	1	Muñoz *et al*. 2009
PAS	*Passer domesticus*	Cádiz	Spain	1	Muñoz, 2008g
PAS	*Passer domesticus*	Cádiz	Spain	1	Muñoz, 2008k
PAS	*Passer domesticus*	Cádiz	Spain	8	Muñoz, 2008n
PAS	*Passer domesticus*	Cádiz	Spain	1	Fernández, 2009
PAS	*Passer domesticus*	Cádiz	Spain	3	Lazo *et al*., 2008
PAS	*Passer montanus*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passerculus sandwichensis*	Puerto de Altamont	USA	2	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passerculus sandwichensis*	Stateline (Oregon)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passerculus sandwichensis*	Stateline (Washington)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Passerculus sandwichensis*	Wisconsin	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Passerina cyanea*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Petronia petronia*	Soria	Spain	1	Biovent energía, s.a. 2007c.
PAS	*Petronia petronia*	Soria	Spain	1	Grupo I 2007 (informe 2006).
PAS	*Petronia petronia*	Burgos	Spain	1	Testa. Parque eólico Marmellar. 2008.
PAS	*Petronia petronia*	Guadalajara	Spain	1	Merchén, 2008b
PAS	*Petronia petronia*	Guadalajara	Spain	2	Gutiérrez, 2008a
PAS	*Petronia petronia*	Guadalajara	Spain	1	Gutiérrez, 2008b
PAS	*Petronia petronia*	Albacete	Spain	2	Cañizares, 2003.
PAS	*Petronia petronia*	Albacete	Spain	3	Martínez-Acacio *et al*., 2004
PAS	*Petronia petronia*	Albacete	Spain	1	Cañizares, 2005.
PAS	*Petronia petronia*	Albacete	Spain	1	Torralba, 2006.
PAS	*Petronia petronia*	Albacete	Spain	1	Cañizares, 2005
PAS	*Petronia petronia*	Albacete	Spain	2	Cañizares, 2006
PAS	*Petronia petronia*	Albacete	Spain	2	Gónzalez y Lozano, 2005
PAS	*Petronia petronia*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Petronia petronia*	Albacete	Spain	1	Martínez-Acacio *et al*., 2007
PAS	*Petronia petronia*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Petronia petronia*	Albacete	Spain	4	Tortosa, 2004
PAS	*Petronia petronia*	Aragón	Spain	1	Oper, 2004a
PAS	*Pheucticus ludovicianus*	Mountaineer	USA	3	Kerns et Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Phoenicurus ochruros*	El Perdon	Spain	2	Lekuona, 2001
PAS	*Phoenicurus ochruros*	Navarra	Spain	2	Lekuona, 2001
PAS	*Phoenicurus ochruros*	Albacete	Spain	1	Cañizares, 2003
PAS	*Phoenicurus ochruros*	Albacete	Spain	1	Lozano, 2006
PAS	*Phoenicurus ochruros*	Albacete	Spain	1	Martínez, 2008
PAS	*Phoenicurus ochruros*	Albacete	Spain	2	Fernández y Cañizares, 2001
PAS	*Phoenicurus ochruros*	Aragón	Spain	1	Pelayo *et al*., 2001c
PAS	*Phoenicurus ochruros*	Aragón	Spain	1	Faci, 2004b
PAS	*Phoenicurus ochruros*	Burgos	Spain	1	Eyser. Parque eólico Valdeporres. 2004.
PAS	*Phoenicurus phoenicurus*	Cádiz	Spain	1	Muñoz, 2008k
PAS	*Phoenicurus phoenicurus*	Albacete	Spain	1	Cañizares, 2003
PAS	*Phoenicurus phoenicurus*	Albacete	Spain	1	Lozano, 2006
PAS	*Phoenicurus phoenicurus*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Phoenicurus phoenicurus*	Guadalajara	Spain	1	Merchén, 2008b
PAS	*Phylloscopus collybita*	Elgea-Urkilla	Spain	3	Onrubia *et al*., 2005.
PAS	*Phylloscopus collybita*	Guipúzcoa-Álava	Spain	3	Onrubia *et al*., 2005.
PAS	*Phylloscopus collybita*	Soria	Spain	1	Biovent energía, s.a. 2007a.
PAS	*Phylloscopus collybita*	Cádiz	Spain	1	Lobón y Villar, 2009d
PAS	*Phylloscopus collybita*	Burgos	Spain	2	Eyser. Parque eólico La Magdalena. 2004.
PAS	*Phylloscopus collybita*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Phylloscopus collybita*	Guadalajara	Spain	1	Herranz y Serrano, 2006
PAS	*Phylloscopus collybita*	Guadalajara	Spain	1	Anónimo, 2008

PAS	*Phylloscopus collybita*	Guadalajara	Spain	1	Parra, 2008
PAS	*Phylloscopus collybita*	Albacete	Spain	1	Capilla Folgado *et al.*, 2007c
PAS	*Phylloscopus collybita*	Albacete	Spain	1	Cañizares, 2005
PAS	*Phylloscopus collybita*	Albacete	Spain	2	Cañizares, 2006
PAS	*Phylloscopus collybita*	Albacete	Spain	4	Gónzalez y Lozano, 2004
PAS	*Phylloscopus collybita*	Albacete	Spain	1	Vázquez, 2004
PAS	*Phylloscopus collybita*	Albacete	Spain	1	González, 2007
PAS	*Phylloscopus collybita*	Albacete	Spain	1	González, 2006c
PAS	*Phylloscopus collybita*	Aragón	Spain	1	Faci *et al.*, 2005
PAS	*Phylloscopus collybita*	Aragón	Spain	1	Faci, 2005c
PAS	*Phylloscopus collybita*	Aragón	Spain	2	Icarus, 2006
PAS	*Phylloscopus ibericus*	Álava	Spain	1	Onrubia *et al.*, 2003.
PAS	*Phylloscopus inornatus*	Guadalajara	Spain	1	Ruiz, 2008a
PAS	*Phylloscopus sibilatrix*	Aragón	Spain	1	L'auca, 2006
PAS	*Phylloscopus sp.*	Soria	Spain	2	Portulano, 2006b.
PAS	*Phylloscopus sp.*	Soria	Spain	2	Portulano, 2006a.
PAS	*Phylloscopus sp.*	Aragón	Spain	1	Sáenz y Lizarraga, 2007
PAS	*Phylloscopus trochilus*	Elgea-Urkilla	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Guadalajara	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Guadalajara	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Guadalajara	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Phylloscopus trochilus*	Albacete	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Pica pica*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Pica pica*	Soria	Spain	1	Portulano, 2006c.
PAS	*Pica pica*	Escaut	Netherlands	1	Everaert *et al.*, 2003. En: Kingsley y Whittam, 2007.
PAS	*Pica pica*	Stateline (Oregon)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Pica pica*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Pica pica*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2004
PAS	*Pica pica*	Albacete	Spain	1	Martínez-Acacio, 2003
PAS	*Pica pica*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Pica pica*	Albacete	Spain	2	Torralba, 2005.
PAS	*Pica pica*	Albacete	Spain	1	Torralba, 2006.
PAS	*Pica pica*	Albacete	Spain	2	Erans y Domínguez, 2007b
PAS	*Pica pica*	Albacete	Spain	1	Capilla Folgado *et al.*, 2008
PAS	*Pica pica*	Albacete	Spain	1	Cañizares, 2006
PAS	*Pica pica*	Albacete	Spain	1	Capilla Folgado *et al.*, 2007b
PAS	*Pica pica*	Albacete	Spain	2	Capilla Folgado *et al.*, 2006c
PAS	*Pica pica*	Albacete	Spain	1	Capilla Folgado *et al.*, 2008b
PAS	*Pica pica*	Albacete	Spain	3	Cañizares, 2005
PAS	*Pica pica*	Albacete	Spain	2	Cañizares, 2006
PAS	*Pica pica*	Albacete	Spain	1	Cañizares, 2008d
PAS	*Pica pica*	Albacete	Spain	1	Martínez, 2008
PAS	*Pica pica*	Albacete	Spain	1	Vázquez y Uña, 2005
PAS	*Pica pica*	Albacete	Spain	1	Martínez-Acacio, 2005b.
PAS	*Pica pica*	Albacete	Spain	3	Fernández y Cañizares, 2001
PAS	*Pica pica*	Albacete	Spain	1	Cañizares y Tortosa, 2003
PAS	*Pica pica*	Aragón	Spain	1	Antón, 2006
PAS	*Pica pica*	Aragón	Spain	1	Oper, 2004c
PAS	*Pica pica*	Aragón	Spain	1	Oper, 2006d
PAS	*Picus viridis*	Álava	Spain	1	Onrubia *et al.*, 2003.
PAS	*Picus viridis*	Albacete	Spain		Lozano, 2006
PAS	*Pipilo chlorurus*	Foote Creek Rim	USA	2	Johnson *et al.*, 2001.
PAS	*Pipilo maculatus*	Nine Canyon (Washington)	USA	1	Erickson *et al.*, 2003. En: Kingsley y Whittam, 2007.
PAS	*Piranga ludoviciana*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001.
PAS	*Pooecetes gramineus*	Buffalo Ridge	USA	2	Johnson *et al.*, 2002.
PAS	*Pooecetes gramineus*	Foote Creek Rim	USA	7	Johnson *et al.*, 2001.
PAS	*Pooecetes gramineus*	Stateline (Washington)	USA	2	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Progne subis*	Buffalo Ridge	USA	1	Johnson *et al.*, 2002. En: Kingsley y Whittam, 2007.
PAS	*Ptyonoprogne rupestris*	Álava	Spain	1	Onrubia *et al.*, 2003.
PAS	*Ptyonoprogne rupestris*	Aragón	Spain	1	Pelayo *et al.*, 2001
PAS	*Ptyonoprogne rupestris*	Aragón	Spain	1	Pelayo *et al.*, 2002
PAS	*Ptyonoprogne rupestris*	Aragón	Spain	1	Pelayo *et al.*, 2002
PAS	*Pyrrhocorax pyrrhocorax*	Guadalajara	Spain	1	Parra, 2008a
PAS	*Pyrrhocorax pyrrhocorax*	Burgos	Spain	1	Parque eólico Lodoso, 2007
PAS	*Quiscalus quiscula*	Buffalo Ridge	USA	1	Johnson *et al.*, 2002.
PAS	*Regulus calendula*	McBride Lake (Alberta)	Canada	1	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
PAS	*Regulus calendula*	Buffalo Ridge	USA	1	Strickland *et al.*, 2000. En: Kingsley y Whittam, 2007.
PAS	*Regulus calendula*	Buffalo Ridge	USA	1	Johnson *et al.*, 2002. En: Kingsley y Whittam, 2007.
PAS	*Regulus calendula*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.

PAS	*Regulus calendula*	Klondike (Oregon)	USA	1	Johnson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Regulus calendula*	Nine Canyon (Washington)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Regulus calendula*	Stateline (Oregon)	USA	1	West Inc.y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Regulus ignicapillus*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Regulus ignicapillus*	Álava	Spain	2	Onrubia *et al*., 2003.
PAS	*Regulus ignicapillus*	Elgea-Urkilla	Spain	2	Onrubia *et al*., 2004.
PAS	*Regulus ignicapillus*	Guipúzcoa-Álava	Spain	2	Onrubia *et al*., 2004.
PAS	*Regulus ignicapillus*	Izco	Spain	1	Lekuona, 2001.
PAS	*Regulus ignicapillus*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Regulus ignicapillus*	Soria	Spain	1	Portulano, 2006c.
PAS	*Regulus ignicapillus*	Soria	Spain	1	Biovent energía, s.a. 2007a.
PAS	*Regulus ignicapillus*	Soria	Spain	1	Biovent energía, s.a. 2006b.
PAS	*Regulus ignicapillus*	Guadalajara	Spain	1	Parra, 2008a.
PAS	*Regulus ignicapillus*	Guadalajara	Spain	2	Parra, 2008b.
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Erans y Domínguez, 2007a
PAS	*Regulus ignicapillus*	Albacete	Spain	2	Martínez-Acacio *et al*., 2003
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Martínez-Acacio, 2003
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Capilla Folgado *et al*., 2007a
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Torralba, 2004
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Cañizares, 2008d
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Vázquez, 2005
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Vázquez y Uña, 2005
PAS	*Regulus ignicapillus*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Pelayo *et al*, 1999
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Regulus ignicapillus*	Aragón	Spain	7	Pelayo *et al*., 2001a
PAS	*Regulus ignicapillus*	Aragón	Spain	2	Pelayo *et al*., 2002
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Sáenz y Lizarraga, 2009
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Faci, 2004
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Sampietro *et al*., 2012
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Rivas *et al*., 2003
PAS	*Regulus ignicapillus*	Aragón	Spain	1	Oper, 2004g
PAS	*Regulus regulus*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Regulus regulus*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R., 2006.
PAS	*Regulus regulus*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Regulus regulus*	Burgos	Spain	1	Eyser. Parques eólicos Valdeporres. 2004.
PAS	*Regulus regulus*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Regulus regulus*	Aragón	Spain	1	L'auca, 2006
PAS	*Regulus satrapa*	Castle River (Alberta)	Canada	1	Brown, comm. pers. . En: Kingsley y Whittam, 2007.
PAS	*Regulus satrapa*	Klondike (Oregon)	USA	1	Johnson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Regulus satrapa*	Stateline (Oregon)	USA	10	West Inc.y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Regulus satrapa*	Stateline (Washington)	USA	10	West Inc.y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Regulus satrapa*	Wisconsin	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Rhinolophus sp*	Aragón	Spain	1	Pelayo *et al*, 1999
PAS	*Riparia riparia*	Cádiz	Spain	1	Muñoz, 2008o
PAS	*Riparia riparia*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Riparia riparia*	Aragón	Spain	1	Galerida, 2006
PAS	*Salpinctes obsoletus*	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Salpinctes obsoletus*	Foote Creek Rim	USA	4	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Saxicola rubetra*	Brandenburg	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Saxicola rubetra*	Albacete	Spain	1	Tortosa, 2003b.
PAS	*Saxicola torquata*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Saxicola torquata*	El Perdon	Spain	1	Lekuona, 2001.
PAS	*Saxicola torquata*	Cádiz	Spain	1	Muñoz, 2008l.
PAS	*Saxicola torquata*	Cádiz	Spain	1	Lobón y Villar, 2009e.
PAS	*Saxicola torquata*	Guadalajara	Spain	1	Parra, 2008d
PAS	*Saxicola torquata*	Albacete	Spain	1	Martínez-Acacio, 2005a.
PAS	*Saxicola torquata*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
PAS	*Saxicola torquata*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Saxicola torquata*	Albacete	Spain	1	Torralba, 2004
PAS	*Saxicola torquata*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Saxicola torquata*	Albacete	Spain	1	Tortosa, 2004
PAS	*Saxicola torquata*	Aragón	Spain	1	Oper, 2005h
PAS	*Sayornis saya*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Setophaga ruticilla*	Mountaineer	USA	2	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sialia currucoides*	Foote Creek Rim	USA	2	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Sialia currucoides*	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Sialia currucoides*	Puerto de Altamont	USA	5	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sialia mexicana*	Puerto de Altamont	USA	2	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Sitta canadensis*	Nine Canyon (Washington)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Sitta canadensis*	Stateline (Oregon)	USA	2	West Inc.y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Spiza americana*	Buffalo Ridge	USA	1	Strickland *et al*., 2000. En: Kingsley y Whittam, 2007.

PAS	*Spiza americana*	Buffalo Ridge	USA	1	Johnson *et al*., 2002.
PAS	*Spizella breweri*	Foote Creek Rim	USA	5	Johnson *et al*., 2001.
PAS	*Spizella passerina*	Buffalo Ridge	USA	1	Johnson *et al*., 2002.
PAS	*Spizella passerina*	Foote Creek Rim	USA	5	Johnson *et al*., 2001.
PAS	*Sturnella neglecta*	Buffalo Ridge	USA	1	Johnson *et al*., 2002.
PAS	*Sturnella neglecta*	Col de Tehachapi	USA	6	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Foote Creek Rim	USA	1	Johnson *et al*., 2001.
PAS	*Sturnella neglecta*	Montezuma Hills	USA	1	Howell y Noone, 1992 Howell, 1997. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Nine Canyon (Washington)	USA	2	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Puerto de Altamont	USA	8	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Puerto de Altamont	USA	40	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Puerto de Altamont	USA	99	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Puerto de Solano	USA	1	Bryne, 1983. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Stateline (Oregon)	USA	5	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnella neglecta*	Stateline (Washington)	USA	7	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus unicolor*	Cádiz	Spain	1	Lobón y Villar, 2009a
PAS	*Sturnus unicolor*	Cádiz	Spain	1	Lobón y Villar, 2009c
PAS	*Sturnus unicolor*	Cádiz	Spain	1	Muñoz, 2008g
PAS	*Sturnus unicolor*	Cádiz	Spain	1	Muñoz, 2008n
PAS	*Sturnus unicolor*	Cádiz	Spain	1	Fernández, 2008b
PAS	*Sturnus unicolor*	Cádiz	Spain	1	Fernández, 2009b
PAS	*Sturnus unicolor*	Albacete	Spain	1	Vázquez, 2004
PAS	*Sturnus unicolor*	Guadalajara	Spain	1	Parra, 2008b.
PAS	*Sturnus unicolor*	Guadalajara	Spain	1	Ruiz, 2008a
PAS	*Sturnus unicolor*	Guadalajara	Spain	1	Ruiz, 2008b.
PAS	*Sturnus unicolor*	Albacete	Spain	2	Cañizares, 2003.
PAS	*Sturnus unicolor*	Albacete	Spain	1	Martínez-Acacio, 2005a.
PAS	*Sturnus unicolor*	Albacete	Spain	2	Martínez-Acacio *et al*., 2004
PAS	*Sturnus unicolor*	Albacete	Spain	1	Cañizares, 2005.
PAS	*Sturnus unicolor*	Albacete	Spain	1	Martínez-Acacio, 2003
PAS	*Sturnus unicolor*	Albacete	Spain	7	Cañizares y Torralba, 2004
PAS	*Sturnus unicolor*	Albacete	Spain	1	Cañizares, 2006
PAS	*Sturnus unicolor*	Albacete	Spain	1	Cañizares, 2005
PAS	*Sturnus unicolor*	Albacete	Spain	10	Cañizares, 2006
PAS	*Sturnus unicolor*	Albacete	Spain	2	Cañizares, 2008d
PAS	*Sturnus unicolor*	Albacete	Spain	2	Gónzalez y Lozano, 2004
PAS	*Sturnus unicolor*	Albacete	Spain	6	Gónzalez y Lozano, 2005
PAS	*Sturnus unicolor*	Albacete	Spain	5	Cañizares, 2008e
PAS	*Sturnus unicolor*	Albacete	Spain	2	Vázquez, 2004
PAS	*Sturnus unicolor*	Albacete	Spain	2	Vázquez, 2005
PAS	*Sturnus unicolor*	Albacete	Spain	6	Lozano, 2006
PAS	*Sturnus unicolor*	Albacete	Spain	2	González, 2007
PAS	*Sturnus unicolor*	Albacete	Spain	2	Martínez, 2008
PAS	*Sturnus unicolor*	Albacete	Spain	1	Martínez-Acacio, 2005b.
PAS	*Sturnus unicolor*	Albacete	Spain	1	González, 2006c
PAS	*Sturnus unicolor*	Albacete	Spain	1	Domínguez, 2008
PAS	*Sturnus unicolor*	Aragón	Spain	3	Pelayo *et al*, 1999
PAS	*Sturnus unicolor*	Aragón	Spain	1	EIN Castilla La Mancha, 2007
PAS	*Sturnus unicolor*	Aragón	Spain	2	Faci *et al*., 2003
PAS	*Sturnus unicolor*	Aragón	Spain	1	Rivas *et al*., 2003
PAS	*Sturnus unicolor*	Aragón	Spain	1	Oper, 2004b
PAS	*Sturnus unicolor*	Aragón	Spain	1	Oper, 2004d
PAS	*Sturnus unicolor*	Aragón	Spain	1	Oper, 2006b
PAS	*Sturnus unicolor*	Aragón	Spain	1	Oper, 2006c
PAS	*Sturnus unicolor*	Aragón	Spain	1	Oper, 2006d
PAS	*Sturnus unicolor*	Aragón	Spain	1	Icarus, 2006
PAS	*Sturnus unicolor*	Aragón	Spain	1	Faci *et al*., 2005b
PAS	*Sturnus vulgaris*	Brandenburg	Germany	2	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Niedersachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Sachsen	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Exhibition Place, Toronto	Canada	1	James y Coady, 2003. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	McBride Lake (Alberta)	Canada	5	Brown y Hamilton, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Canal Boudewijn, Bruges	Netherlands	8	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Escaut	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Kreekrak (Pays-Bas)	Netherlands	1	Musters *et al*., 1996. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Col de Tehachapi	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Klondike (Oregon)	USA	1	Johnson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Nine Canyon (Washington)	USA	1	Erickson *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Puerto de Altamont	USA	67	Smallwood et Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Puerto de Altamont	USA	4	Thelander y Rugge, 2000. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Puerto de Altamont	USA	17	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Puerto de Solano	USA	1	Bryne, 1983. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	San Gorgonio	USA	1	Anderson *et al*., 2000. En: Kingsley y Whittam, 2007.

PAS	*Sturnus vulgaris*	Stateline (Washington)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Stateline (Oregon)	USA	4	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Wisconsin	USA	3	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Sturnus vulgaris*	Cádiz	Spain	1	Muñoz, 2008g
PAS	*Sturnus vulgaris*	Aragón	Spain	1	Oper, 2005g
PAS	*Sturnus vulgaris*	Cádiz	Spain	1	Muñoz, 2008g.
PAS	*Sturnus vulgaris*	Albacete	Spain	1	*Ovidio et al., 2006*
PAS	*Sturnus vulgaris*	Albacete	Spain	1	Erans y Domínguez, 2007a
PAS	*Sturnus vulgaris*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Sturnus vulgaris*	Albacete	Spain	1	Lozano, 2006
PAS	*Sturnus vulgaris*	Aragón	Spain	1	Antón, 2006
PAS	*Sturnus vulgaris*	Aragón	Spain	1	Martín-Barajas *et al.*, 2006
PAS	*Sylvia atricapilla*	Alaiz	Spain	1	Lekuona, 2001.
PAS	*Sylvia atricapilla*	Álava	Spain	2	Onrubia *et al.*, 2003.
PAS	*Sylvia atricapilla*	Elgea-Urkilla	Spain	4	Onrubia *et al.*, 2004.
PAS	*Sylvia atricapilla*	Elgea-Urkilla	Spain	3	Onrubia *et al*,. 2005.
PAS	*Sylvia atricapilla*	Guennda	Spain	2	Lekuona, 2001.
PAS	*Sylvia atricapilla*	Guipúzcoa-Álava	Spain	3	Onrubia *et al.*, 2005.
PAS	*Sylvia atricapilla*	Guipúzcoa-Álava	Spain	5	Onrubia *et al.*, 2004.
PAS	*Sylvia atricapilla*	Izco	Spain	1	Lekuona, 2001.
PAS	*Sylvia atricapilla*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Sylvia atricapilla*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Sylvia atricapilla*	Navarra	Spain	2	Lekuona, 2001.
PAS	*Sylvia atricapilla*	Soria	Spain	1	Portulano, 2006a.
PAS	*Sylvia atricapilla*	Soria	Spain	1	Portulano, 2006a.
PAS	*Sylvia atricapilla*	Soria	Spain	1	Portulano, 2007.
PAS	*Sylvia atricapilla*	Guadalajara	Spain	1	Ruiz, 2008a
PAS	*Sylvia atricapilla*	Guadalajara	Spain	3	Parra, 2008
PAS	*Sylvia atricapilla*	Guadalajara	Spain	1	Gutiérrez, 2008a
PAS	*Sylvia atricapilla*	Guadalajara	Spain	1	Parra, 2008d
PAS	*Sylvia atricapilla*	Albacete	Spain	1	*Ovidio et al., 2006*
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Cañizares, 2008a.
PAS	*Sylvia atricapilla*	Albacete	Spain	16	Cañizares, 2003.
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2003
PAS	*Sylvia atricapilla*	Albacete	Spain	4	Martínez-Acacio *et al.*, 2004
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Cañizares, 2005.
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Mariño, 2007.
PAS	*Sylvia atricapilla*	Albacete	Spain	6	Martínez-Acacio, 2003
PAS	*Sylvia atricapilla*	Albacete	Spain	12	Cañizares y Torralba, 2004
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Torralba, 2005.
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Erans *et al.*, 2008
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Cañizares, 2007.
PAS	*Sylvia atricapilla*	Albacete	Spain	2	Torralba, 2004
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Cañizares, 2005
PAS	*Sylvia atricapilla*	Albacete	Spain	10	Cañizares, 2006
PAS	*Sylvia atricapilla*	Albacete	Spain	6	Gónzalez y Lozano, 2004
PAS	*Sylvia atricapilla*	Albacete	Spain	3	Gónzalez y Lozano, 2005
PAS	*Sylvia atricapilla*	Albacete	Spain	17	Cañizares, 2008e
PAS	*Sylvia atricapilla*	Albacete	Spain	7	Cañizares, 2008e
PAS	*Sylvia atricapilla*	Albacete	Spain	6	Vázquez, 2004
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Vázquez, 2004
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Lozano, 2006
PAS	*Sylvia atricapilla*	Albacete	Spain	1	González, 2007
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Martínez, 2008
PAS	*Sylvia atricapilla*	Albacete	Spain	2	González, 2006c
PAS	*Sylvia atricapilla*	Albacete	Spain	1	Lozano, 2008
PAS	*Sylvia atricapilla*	Albacete	Spain	9	Fernández y Cañizares, 2001
PAS	*Sylvia atricapilla*	Albacete	Spain	2	Cañizares y Tortosa, 2003
PAS	*Sylvia atricapilla*	Albacete	Spain	8	Tortosa, 2004
PAS	*Sylvia atricapilla*	Aragón	Spain	3	Pelayo *et al.*, 2001a
PAS	*Sylvia atricapilla*	Aragón	Spain	3	Pelayo *et al.*, 2002
PAS	*Sylvia atricapilla*	Aragón	Spain	1	Antón, 2005b
PAS	*Sylvia atricapilla*	Aragón	Spain	1	Faci, 2004
PAS	*Sylvia atricapilla*	Aragón	Spain	2	Sampietro *et al.*, 2005
PAS	*Sylvia atricapilla*	Aragón	Spain	1	Faci, 2004b
PAS	*Sylvia atricapilla*	Burgos	Spain	2	Eyser
PAS	*Sylvia atricapilla*	Burgos	Spain	2	EOS Ingeniería y Consultoría Ambiental
PAS	*Sylvia atricapilla*	Burgos	Spain	1	
PAS	*Sylvia atricapilla*		Spain		Eyser
PAS	*Sylvia atricapilla*		Spain		EOS Ingeniería y Consultoría Ambiental
PAS	*Sylvia borin*	Albacete	Spain	3	Cañizares, 2003.
PAS	*Sylvia borin*	Albacete	Spain	1	Cañizares, 2006
PAS	*Sylvia borin*	Albacete	Spain	2	Gónzalez y Lozano, 2005
PAS	*Sylvia borin*	Albacete	Spain	1	Lozano, 2006
PAS	*Sylvia cantillans*	Albacete	Spain	1	Vázquez, 2004
PAS	*Sylvia cantillans*	Guadalajara	Spain	1	Parra, 2008a.
PAS	*Sylvia cantillans*	Guadalajara	Spain	2	Merchén, 2008a

PAS	*Sylvia cantillans*	Albacete	Spain	4	Cañizares, 2003.
PAS	*Sylvia cantillans*	Albacete	Spain	1	Martínez-Acacio, 2004.
PAS	*Sylvia cantillans*	Albacete	Spain	4	Martínez-Acacio *et al.*, 2003
PAS	*Sylvia cantillans*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2004
PAS	*Sylvia cantillans*	Albacete	Spain	1	Tortosa, 2003b.
PAS	*Sylvia cantillans*	Albacete	Spain	2	Martínez-Acacio, 2003
PAS	*Sylvia cantillans*	Albacete	Spain	2	Cañizares y Torralba, 2004
PAS	*Sylvia cantillans*	Albacete	Spain	1	Cañizares, 2008c
PAS	*Sylvia cantillans*	Albacete	Spain	1	Cañizares, 2006
PAS	*Sylvia cantillans*	Albacete	Spain	3	Gónzalez y Lozano, 2005
PAS	*Sylvia cantillans*	Albacete	Spain	5	Cañizares, 2008e
PAS	*Sylvia cantillans*	Albacete	Spain	1	Lozano, 2006
PAS	*Sylvia cantillans*	Albacete	Spain	1	Martínez, 2008
PAS	*Sylvia cantillans*	Albacete	Spain	6	Fernández y Cañizares, 2001
PAS	*Sylvia cantillans*	Albacete	Spain	3	Cañizares y Tortosa, 2003
PAS	*Sylvia cantillans*	Albacete	Spain	1	Tortosa, 2004
PAS	*Sylvia cantillans*	Aragón	Spain	2	Pelayo *et al.*, 2001a
PAS	*Sylvia communis*	Guennda	Spain	1	Lekuona, 2001.
PAS	*Sylvia communis*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Sylvia communis*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Sylvia communis*	Albacete	Spain	1	Cañizares y Tortosa, 2003
PAS	*Sylvia communis*	Aragón	Spain	1	Pelayo *et al.*, 2002
PAS	*Sylvia communis*	Aragón	Spain	1	Rivas *et al.*, 2004
PAS	*Sylvia conspicillata*	Albacete	Spain	1	González, 2006c
PAS	*Sylvia conspicillata*	Albacete	Spain	4	Tortosa, 2004
PAS	*Sylvia hortensis*	Guadalajara	Spain	1	Merchén, 2008b
PAS	*Sylvia hortensis*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Sylvia hortensis*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2003
PAS	*Sylvia melanocephala*	Cádiz	Spain	1	Clemente, 2009b
PAS	*Sylvia melanocephala*	Albacete	Spain	1	Cañizares, 2003.
PAS	*Sylvia melanocephala*	Albacete	Spain	1	Cañizares, 2005
PAS	*Sylvia melanocephala*	Albacete	Spain	1	Cañizares, 2006
PAS	*Sylvia melanocephala*	Albacete	Spain	1	Vázquez, 2004
PAS	*Sylvia melanocephala*	Albacete	Spain	1	Vázquez y Uña, 2005
PAS	*Sylvia melanocephala*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Sylvia melanocephala*	Aragón	Spain	1	Rivas *et al.*, 2003
PAS	*Sylvia undata*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2004
PAS	*Sylvia undata*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Sylvia undata*	Albacete	Spain	1	Vázquez, 2004
PAS	*Sylvia undata*	Albacete	Spain	1	Vázquez, 2004
PAS	*Sylvia undata*	Albacete	Spain	1	González, 2006b
PAS	*Sylvia undata*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Sylvia undata*	Albacete	Spain	2	Cañizares y Tortosa, 2003
PAS	*Sylvia undata*	Albacete	Spain	3	Tortosa, 2004
PAS	*Sylvia undata*	Aragón	Spain	1	Pelayo *et al.*, 2002
PAS	*Tachycineta bicolor*	Foote Creek Rim	USA	1	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Tachycineta bicolor*	Iowa	USA	1	Koford, 2003. En: Kingsley y Whittam, 2007.
PAS	*Tachycineta bicolor*	Wisconsin	USA	2	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Tachycineta thalassina*	Puerto de Altamont	USA	1	Erickson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Tachycineta thalassina*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes aedon*	Foote Creek Rim	USA	2	Johnson *et al.*, 2001. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes aedon*	Klondike (Oregon)	USA	1	Jonson *et al.*, 2003.En: Kingsley y Whittam, 2007.
PAS	*Troglodytes aedon*	Stateline (Oregon)	USA	1	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes aedon*	Stateline (Washington)	USA	2	West Inc.y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes troglodytes*	Nine Canyon (Washington)	USA	1	Erickson *et al.*, 2003. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes troglodytes*	Stateline (Oregon)	USA	2	West Inc.y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes troglodytes*	Stateline (Washington)	USA	2	West Inc. et Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Troglodytes troglodytes*	Albacete	Spain	1	Vázquez, 2003
PAS	*Turdus iliacus*	Schleswig-Holstein	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Turdus iliacus*	Álava	Spain	1	Onrubia *et al.*, 2003.
PAS	*Turdus iliacus*	Elgea-Urkilla	Spain	1	Onrubia *et al.*, 2004.
PAS	*Turdus iliacus*	Guipúzcoa-Álava	Spain	1	Onrubia *et al.*, 2005.
PAS	*Turdus iliacus*	Guadalajara	Spain	1	Anónimo, 2008
PAS	*Turdus iliacus*	Albacete	Spain	1	Martínez-Acacio *et al.*, 2004
PAS	*Turdus iliacus*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Turdus iliacus*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Turdus iliacus*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Turdus iliacus*	Castilla y León	Spain	1	EOS Ingeniería y Consultoría Ambiental
PAS	*Turdus iliacus*	Castilla y León	Spain	1	Eyser
PAS	*Turdus merula*	El Perdon	Spain	1	Lekuona, 2001.
PAS	*Turdus merula*	Elgea-Urkilla	Spain	3	Onrubia *et al.*, 2005
PAS	*Turdus merula*	Guennda	Spain	1	Lekuona, 2001.
PAS	*Turdus merula*	Guipúzcoa-Álava	Spain	1	Onrubia *et al.*, 2005.
PAS	*Turdus merula*	Izco	Spain	1	Lekuona, 2001.
PAS	*Turdus merula*	Navarra	Spain	1	Lekuona, 2001.

PAS	*Turdus merula*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Turdus merula*	Navarra	Spain	1	Lekuona, 2001.
PAS	*Turdus merula*	Vizkaya	Spain	1	Buenetxea, X. y Garaita, R., 2006.
PAS	*Turdus merula*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Turdus merula*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a.
PAS	*Turdus merula*	Guadalajara	Spain	1	Parra, 2008a.
PAS	*Turdus merula*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005b.
PAS	*Turdus merula*	Albacete	Spain	1	Tortosa y Cañizares, 2003
PAS	*Turdus merula*	Albacete	Spain	1	Tortosa, 2005.
PAS	*Turdus merula*	Albacete	Spain	1	Barrit, 2008
PAS	*Turdus merula*	Albacete	Spain	2	Cañizares, 2006
PAS	*Turdus merula*	Albacete	Spain	3	Cañizares, 2008e
PAS	*Turdus merula*	Albacete	Spain	1	Vázquez, 2004
PAS	*Turdus merula*	Albacete	Spain	2	Vázquez, 2004
PAS	*Turdus merula*	Albacete	Spain	2	Lozano, 2006
PAS	*Turdus merula*	Albacete	Spain	1	González, 2006b
PAS	*Turdus merula*	Albacete	Spain	1	González, 2007
PAS	*Turdus merula*	Albacete	Spain	4	Martínez, 2008
PAS	*Turdus merula*	Albacete	Spain	2	Vázquez y Uña, 2005
PAS	*Turdus merula*	Albacete	Spain	2	Fernández y Cañizares, 2001
PAS	*Turdus merula*	Aragón	Spain	1	Pelayo *et al*., 2001a
PAS	*Turdus merula*	Aragón	Spain	1	Pelayo *et al*., 2001b
PAS	*Turdus migratorius*	Exhibition Place, Toronto	Canada	1	James y Cody, 2003. En: Kingsley y Whittam, 2007.
PAS	*Turdus migratorius*	Rivière Castle (Alberta)	Canada	1	Brown, comm. pers. En: Kingsley y Whittam, 2007.
PAS	*Turdus migratorius*	Foote Creek Rim	USA	1	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Turdus migratorius*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Turdus philomelos*	Álava	Spain	1	Onrubia *et al*., 2003.
PAS	*Turdus philomelos*	Álava	Spain	3	Onrubia *et al*., 2001.
PAS	*Turdus philomelos*	Elgea-Urkilla	Spain	3	Onrubia *et al*., 2005.
PAS	*Turdus philomelos*	Elgea-Urkilla	Spain	2	Consultora de Recursos Naturales S.L., 2006.
PAS	*Turdus philomelos*	Guipúzcoa-Álava	Spain	2	Consultora de Recursos Naturales S.L., 2006.
PAS	*Turdus philomelos*	Guipúzcoa-Álava	Spain	3	Onrubia *et al*., 2005.
PAS	*Turdus philomelos*	Soria	Spain	1	ENDUSA, 2006.
PAS	*Turdus philomelos*	Vizkaya	Spain	1	Unamuno *et al*., 2005.
PAS	*Turdus philomelos*	Barrage de l'Est, Zeebrugge	Netherlands	2	Everaert *et al*., 2002.
PAS	*Turdus philomelos*	Barrage de l'Est, Zeebrugge	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Turdus philomelos*	Canal Boudewijn, Bruges	Netherlands	1	Everaert *et al*., 2003. En: Kingsley y Whittam, 2007.
PAS	*Turdus philomelos*	Guadalajara	Spain	2	EIN Castilla La Mancha, 2005a.
PAS	*Turdus philomelos*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005b.
PAS	*Turdus philomelos*	Guadalajara	Spain	2	Merchén, 2008a
PAS	*Turdus philomelos*	Guadalajara	Spain	1	Herranz y Serrano, 2006
PAS	*Turdus philomelos*	Guadalajara	Spain	1	Merchén, 2008b
PAS	*Turdus philomelos*	Guadalajara	Spain	1	Serrano, 2006
PAS	*Turdus philomelos*	Guadalajara	Spain	3	Gutiérrez, 2008a
PAS	*Turdus philomelos*	Guadalajara	Spain	1	Gutiérrez, 2008b
PAS	*Turdus philomelos*	Guadalajara	Spain	2	Parra, 2008d
PAS	*Turdus philomelos*	Albacete	Spain	2	*Ovidio et al., 2006*
PAS	*Turdus philomelos*	Albacete	Spain	4	Cañizares, 2003.
PAS	*Turdus philomelos*	Albacete	Spain	1	Martínez-Acacio, 2005a.
PAS	*Turdus philomelos*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
PAS	*Turdus philomelos*	Albacete	Spain	1	Mariño, 2007.
PAS	*Turdus philomelos*	Albacete	Spain	1	Tortosa, 2005.
PAS	*Turdus philomelos*	Albacete	Spain	2	González y Tortosa, 2006.
PAS	*Turdus philomelos*	Albacete	Spain	1	Cañizares y Torralba, 2004
PAS	*Turdus philomelos*	Albacete	Spain	3	Torralba, 2005.
PAS	*Turdus philomelos*	Albacete	Spain	1	Torralba, 2006.
PAS	*Turdus philomelos*	Albacete	Spain	1	Cañizares, 2006
PAS	*Turdus philomelos*	Albacete	Spain	1	Torralba, 2004
PAS	*Turdus philomelos*	Albacete	Spain	14	Gónzalez y Lozano, 2004
PAS	*Turdus philomelos*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Turdus philomelos*	Albacete	Spain	14	Cañizares, 2008e
PAS	*Turdus philomelos*	Albacete	Spain	3	Vázquez, 2004
PAS	*Turdus philomelos*	Albacete	Spain	2	Vázquez, 2004
PAS	*Turdus philomelos*	Albacete	Spain	1	Vázquez, 2005
PAS	*Turdus philomelos*	Albacete	Spain	2	Lozano, 2006
PAS	*Turdus philomelos*	Albacete	Spain	5	González, 2007
PAS	*Turdus philomelos*	Albacete	Spain	10	Martínez, 2008
PAS	*Turdus philomelos*	Albacete	Spain	5	Fernández y Cañizares, 2001
PAS	*Turdus philomelos*	Albacete	Spain	1	Cañizares y Tortosa, 2003
PAS	*Turdus philomelos*	Albacete	Spain	1	Tortosa, 2004
PAS	*Turdus philomelos*	Aragón	Spain	2	Pelayo *et al*., 2001a
PAS	*Turdus philomelos*	Aragón	Spain	1	Sáenz y Lizarraga, 2001
PAS	*Turdus philomelos*	Aragón	Spain	1	Antón, 200
PAS	*Turdus philomelos*	Aragón	Spain	1	Rivas *et al*., 2003
PAS	*Turdus philomelos*	Aragón	Spain	1	Oper, 2005b
PAS	*Turdus philomelos*	Aragón	Spain	2	Oper, 2005f
PAS	*Turdus pilaris*	Sachsen-Anhalt	Germany	1	Durr, 2004. En: Kingsley y Whittam, 2007.
PAS	*Turdus pilaris*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2005.
PAS	*Turdus pilaris*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2005.

PAS	*Turdus pilaris*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005a.
PAS	*Turdus pilaris*	Guadalajara	Spain	1	EIN Castilla La Mancha, 2005b.
PAS	*Turdus sp*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Turdus sp*	Aragón	Spain	1	Sampietro *et al*., 2003
PAS	*Turdus torquatus*	Albacete	Spain	1	Lozano, 2008
PAS	*Turdus viscivorus*	Álava	Spain	1	Onrubia *et al*., 2003.
PAS	*Turdus viscivorus*	Elgea-Urkilla	Spain	1	Consultora de recursos Naturales S.L.,2007b.
PAS	*Turdus viscivorus*	Elgea-Urkilla	Spain	1	Onrubia *et al*., 2004.
PAS	*Turdus viscivorus*	Guipúzcoa-Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007b.
PAS	*Turdus viscivorus*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2004.
PAS	*Turdus viscivorus*	Guadalajara	Spain	1	Parra, 2008c
PAS	*Turdus viscivorus*	Guadalajara	Spain	1	Gutiérrez, 2008a
PAS	*Turdus viscivorus*	Albacete	Spain	1	Martínez-Acacio, 2005a.
PAS	*Turdus viscivorus*	Albacete	Spain	1	Cañizares, 2006
PAS	*Turdus viscivorus*	Albacete	Spain	1	Gónzalez y Lozano, 2004
PAS	*Turdus viscivorus*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Turdus viscivorus*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Turdus viscivorus*	Albacete	Spain	1	Vázquez, 2004
PAS	*Turdus viscivorus*	Albacete	Spain	1	González, 2007
PAS	*Turdus viscivorus*	Albacete	Spain	1	Martínez-Acacio *et al*., 2007
PAS	*Turdus viscivorus*	Albacete	Spain	1	Fernández y Cañizares, 2001
PAS	*Turdus viscivorus*	Albacete	Spain	1	Tortosa, 2004
PAS	*Turdus viscivorus*	Aragón	Spain	1	Pelayo *et al*., 2002
PAS	*Turdus viscivorus*	Aragón	Spain	1	Gajón *et al*., 2006b
PAS	*Turdus viscivorus*	Aragón	Spain	1	Oper, 2004a
PAS	*Turdus viscivorus*	Aragón	Spain	1	Oper, 2005e
PAS	*Turdus viscivorus*	Aragón	Spain	3	Oper, 2006b
PAS	*Turdus viscivorus*	Aragón	Spain	1	Oper, 2006d
PAS	*Tyrannus tyrannus*	Wisconsin	USA	1	Erickson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Tyrannus verticalis*	Puerto de Altamont	USA	1	Smallwood y Thelander, 2004. En: Kingsley y Whittam, 2007.
PAS	*Upupa epops*	Albacete	Spain	1	Cañizares, 2006
PAS	*Upupa epops*	Albacete	Spain	1	Gónzalez y Lozano, 2005
PAS	*Upupa epops*	Albacete	Spain	1	Cañizares, 2008e
PAS	*Upupa epops*	Albacete	Spain	1	Vázquez, 2005
PAS	*Vermivora celata*	Buffalo Ridge	USA	4	Johnson *et al*., 2002.
PAS	*Vireo flavifrons*	Iowa	USA	1	Koford, 2003. En: Kingsley y Whittam, 2007.
PAS	*Vireo gilvus*	Buffalo Ridge	USA	1	Johnson *et al*., 2002. En: Kingsley y Whittam, 2007.
PAS	*Vireo gilvus*	Foote Creek Rim	USA	1	Johnson *et al*., 2001. En: Kingsley y Whittam, 2007.
PAS	*Vireo olivaceus*	Mountaineer	USA	21	Kerns et Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Wilsonia canadensis*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Wilsonia citrina*	Mountaineer	USA	1	Kerns y Kerlinger, 2004. En: Kingsley y Whittam, 2007.
PAS	*Wilsonia pusilla*	Foote Creek Rim	USA	3	Johnson *et al*., 2001.
PAS	*Zonotrichia atricapilla*	Stateline (Oregon)	USA	1	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Zonotrichia atricapilla*	Stateline (Washington)	USA	2	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Zonotrichia leucophrys*	Foote Creek Rim	USA	2	Johnson *et al*., 2001.
PAS	*Zonotrichia leucophrys*	Stateline (Oregon)	USA	2	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Zonotrichia leucophrys*	Stateline (Washington)	USA	3	West Inc. y Northwest Wildlife Consultants, 2004. En: Kingsley y Whittam, 2007.
PAS	*Zonotrichia leucophrys*	Vansycle (Oregon)	USA	4	Strickland *et al*., 2000b. En: Kingsley y Whittam, 2007.
MUR	*Eptesicus serotinus*	Brandenburg	Germany	1	Haensel, 2007. En: Rodrigues *et al*. 2008.
MUR	*Eptesicus serotinus*	Freiburg	Germany	1	Brinkmann *et al*., 2006. En: Rodrigues *et al*. 2008.
MUR	*Eptesicus serotinus*		France	2	Cosson, 2004. Cosson y Dulac 2005, 2006 y 2007. En: Rodrigues *et al*. 2008.
MUR	*Eptesicus serotinus*	Cádiz	Spain	1	Muñoz, 2008a
MUR	*Eptesicus serotinus*	Cádiz	Spain	2	Lobón y Villar, 2009a
MUR	*Eptesicus serotinus*	Cádiz	Spain	2	Muñoz, 2008l
MUR	*Eptesicus serotinus*	Cádiz	Spain	2	Arcosur Atlántico, 2009
MUR	*Eptesicus serotinus*	Cádiz	Spain	5	Yarte, 2009
MUR	*Eptesicus serotinus*	Cádiz	Spain	2	Serrano, 2009
MUR	*Eptesicus serotinus*	Cádiz	Spain	6	Lazo *et al*., 2008
MUR	*Eptesicus serotinus*	Albacete	Spain	1	Martínez-Acacio, 2004.
MUR	*Eptesicus serotinus*	Albacete	Spain	1	Cañizares y Torralba, 2004
MUR	*Eptesicus serotinus*	Albacete	Spain	1	Cañizares, 2008b
MUR	*Eptesicus serotinus*	Albacete	Spain	2	Vázquez, 2004
MUR	*Eptesicus serotinus*	Albacete	Spain	1	Vázquez, 2004
MUR	*Eptesicus serotinus*	Albacete	Spain	1	Vázquez, 2003
MUR	*Eptesicus serotinus*	Aragón	Spain	2	Pelayo *et al*, 1999
MUR	*Eptesicus serotinus*	Aragón	Spain	1	Martín-Barajas *et al*., 2006
MUR	*Eptesicus serotinus*	Aragón	Spain	2	Icarus, 2006
MUR	*Hipsugo savii*		Croatia	3	Zagmasjster *et al*. ,2007. En: Rodrigues *et al*. 2008.
MUR	*Hypsugo savii*	Navarra	Spain		Lekuona, 2001. Petri y Munilla 2002. En: Rodrigues *et al*. 2008.
MUR	*Hypsugo savii*	Soria	Spain	1	Biovent energía, s.a. 2007a.
MUR	*Hypsugo savii*	Soria	Spain	4	Biovent energía, s.a. 2007c.
MUR	*Hypsugo savii*	Soria	Spain	1	Biovent energía, s.a. 2007e.
MUR	*Hypsugo savii*	Guadalajara	Spain	1	Parra, 2008b.

MUR	*Hypsugo savii*	Guadalajara	Spain	1	Merchén, 2008a
MUR	*Hypsugo savii*	Guadalajara	Spain	4	Anónimo, 2008
MUR	*Hypsugo savii*	Guadalajara	Spain	1	Ruiz, 2008a
MUR	*Hypsugo savii*	Guadalajara	Spain	3	Merchén, 2008b
MUR	*Hypsugo savii*	Guadalajara	Spain	1	Ruiz, 2008b.
MUR	*Hypsugo savii*	Guadalajara	Spain	1	Ruiz, 2008c.
MUR	*Hypsugo savii*	Guadalajara	Spain	3	Gutiérrez, 2008a
MUR	*Hypsugo savii*	Guadalajara	Spain	1	Merchen, 2008c
MUR	*Hypsugo savii*	Guadalajara	Spain	1	Gutiérrez, 2008b
MUR	*Hypsugo savii*	Guadalajara	Spain	2	Parra, 2008d
MUR	*Hypsugo savii*	Albacete	Spain	3	Cañizares, 2003.
MUR	*Hypsugo savii*	Albacete	Spain	1	Vázquez, 2003
MUR	*Hypsugo savii*	Albacete	Spain	1	Vázquez y Uña, 2005
MUR	*Hypsugo savii*	Albacete	Spain	1	Tortosa, 2004
MUR	*Hypsugo savii*	Aragón	Spain	1	Pelayo et al, 1999
MUR	*Hypsugo savii*	Aragón	Spain	2	Pelayo et al., 2001
MUR	*Hypsugo savii*	Aragón	Spain	2	Pelayo et al., 2001a
MUR	*Hypsugo savii*	Aragón	Spain	5	Pelayo et al., 2002
MUR	*Hypsugo savii*	Aragón	Spain	4	Sáenz y Lizarraga, 2001
MUR	*Hypsugo savii*	Aragón	Spain	1	Antón, 2005a
MUR	*Hypsugo savii*	Aragón	Spain	2	Antón, 2006
MUR	*Hypsugo savii*	Aragón	Spain	4	Sampietro et al., 2013
MUR	*Miniopterus schreibersi*	Guipúzcoa-Álava	Spain	1	Onrubia et al., 2005.
MUR	*Miniopterus schreibersi*	Albacete	Spain	1	Erans et al., 2008
MUR	Murciélago sin identificar	Brandenburg	Germany	36	Dürr (com. Pers.) En: Rodrigues et al. 2008.
MUR	Murciélago sin identificar	Oberlausitz	Germany	2	Trapp et al., 2002. En: Rodrigues et al. 2008.
MUR	Murciélago sin identificar	Saxony	Germany	144	Seiche et al., 2007. En: Rodrigues et al. 2008.
MUR	Murciélago sin identificar	Thuringia	Germany	1	Kusenbach, 2004. En: Rodrigues et al. 2008.
MUR	Murciélago sin identificar		Germany	706	Dürr (com. Pers.) En: Rodrigues et al. 2008.
MUR	Murciélago sin identificar	Navarra	Spain	1	Lekuona, 2001. Petri y Munilla 2002. En: Rodrigues et al. 2008.
MUR	*Myotis dasycneme*	Schleswig-Holstein	Germany	1	Göttsche y Göbel, 2007. En: Rodrigues et al. 2008.
MUR	*Myotis daubentonii*	Schleswig-Holstein	Germany	1	Göttsche y Göbel, 2007. En: Rodrigues et al. 2008.
MUR	*Nyctalus lasiopterus*	Soria	Spain	1	Portulano, 2006b.
MUR	*Nyctalus lasiopterus*	Soria	Spain	1	Biovent energía, s.a. 2007g.
MUR	*Nyctalus lasiopterus*	Guadalajara	Spain	1	Ruiz, 2008a
MUR	*Nyctalus lasiopterus*	Aragón	Spain	1	Sáenz y Lizarraga, 2006
MUR	*Nyctalus leisleri*	Freiburg	Germany	7	Brinkmann et al., 2006. En: Rodrigues et al. 2008.
MUR	*Nyctalus leisleri*	Landkreis Nordhausen	Germany	1	Haase y Rose, 2004. En: Rodrigues et al. 2008.
MUR	*Nyctalus leisleri*	Oberlausitz	Germany	1	Trapp et al., 2002. En: Rodrigues et al. 2008.
MUR	*Nyctalus leisleri*	Rosskopt	Germany	4	Behr y von Helverse, 2006. En: Rodrigues et al. 2008.
MUR	*Nyctalus leisleri*	Álava	Spain	1	Consultora de Recursos Naturales S.L., 2007a.
MUR	*Nyctalus leisleri*	Albacete	Spain	1	Erans et al., 2008
MUR	*Nyctalus noctula*	Brandenburg	Germany	1	Haensel, 2007. En: Rodrigues et al. 2008.
MUR	*Nyctalus noctula*	Oberlausitz	Germany	12	Trapp et al., 2002. En: Rodrigues et al. 2008.
MUR	*Nyctalus noctula*	Schleswig-Holstein	Germany	4	Göttsche y Göbel, 2007. En: Rodrigues *et al*. 2008.
MUR	*Nyctalus noctula*	Thuringia	Germany	1	Kusenbach, 2004. En: Rodrigues *et al*. 2008.
MUR	*Nyctalus noctula*	Lower	Austria	11	Traxler *et al*. , 2004. En: Rodrigues *et al*. 2008.
MUR	*Nyctalus noctula*		France	6	Cosson, 2004. Cosson y Dulac 2005, 2006 y 2007. En: Rodrigues *et al*. 2008.
PAS	*Passer domesticus*	Albacete	Spain	1	Cañizares, 2003.
MUR	*Pipistrellus kuhlii*		France	2	Cosson, 2004. Cosson y Dulac 2005, 2006 y 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus kuhlii*	Aragón	Spain	2	Pelayo *et al*., 2001b
MUR	*Pipistrellus kuhlii*	Aragón	Spain	1	Pelayo *et al*., 2001c
MUR	*Pipistrellus kuhlii*	Guadalajara	Spain		Ruiz, 2008a
MUR	*Pipistrellus kuhlii*	Guadalajara	Spain		Ruiz, 2008c.
MUR	*Pipistrellus kuhlii*	Guadalajara	Spain		Gutiérrez, 2008a
MUR	*Pipistrellus kuhlii*	Guadalajara	Spain		Merchen, 2008c
MUR	*Pipistrellus kuhlii*	Guadalajara	Spain		Gutiérrez, 2008b
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Cañizares, 2008a.
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Martínez-Acacio, 2004.
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Martínez-Acacio, 2005a.
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Martínez-Acacio *et al*., 2004
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Cañizares, 2004.
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Tortosa y Cañizares, 2003
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Cañizares y Torralba, 2004
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Torralba, 2005.
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Cañizares, 2006
MUR	*Pipistrellus kuhlii*	Albacete	Spain		González, 2006b
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Vázquez, 2003
MUR	*Pipistrellus kuhlii*	Albacete	Spain		Cañizares y Tortosa, 2003
MUR	*Pipistrellus kuhlii*	Aragón	Spain		Pelayo *et al*., 2001
MUR	*Pipistrellus kuhlii*	Aragón	Spain		Pelayo *et al*., 2001a
MUR	*Pipistrellus kuhlii*	Aragón	Spain		Pelayo *et al*., 2002
MUR	*Pipistrellus kuhlii*	Aragón	Spain		Rivas *et al*., 2003
MUR	*Pipistrellus kuhlii*	Aragón	Spain		Rivas *et al*., 2004
MUR	*Pipistrellus kuhlii*	Aragón	Spain		Oper, 2003
MUR	*Pipistrellus kuhlii*	Aragón	Spain		L'auca, 2006

MUR	*Pipistrellus kuhlii*	Castilla-La Mancha	Spain		Informe anual nº 4 (enero-diciembre 2007). PVA
MUR	*Pipistrellus nathusii*	Thuringia	Germany	3	Kusenbach, 2004. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus nathussi*	Oberlausitz	Germany	10	Trapp *et al*., 2002. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus nathussi*	Schleswig-Holstein	Germany	10	Göttsche y Göbel, 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus nathussi*	Lower	Austria	2	Traxler *et al*. , 2004. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus nathussi*		France	35	Cosson, 2004. Cosson y Dulac 2005, 2006 y 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Freiburg	Germany	39	Brinkmann *et al*., 2006. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Ittenschwander Horn	Germany	4	Behr *et al*., 2006. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Lahr	Germany	3	Behr y von Helversen, 2005. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Oberlausitz	Germany	3	Trapp *et al*., 2002. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Rosskopt	Germany	23	Behr y von Helverse, 2006. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Schleswig-Holstein	Germany	5	Göttsche y Göbel, 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Navarra	Spain	1	Lekuona, 2001. Petri y Munilla 2002. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Álava	Spain	2	Consultora de Recursos Naturales S.L., 2007a.
MUR	*Pipistrellus pipistrellus*	Guipúzcoa-Álava	Spain	1	Onrubia *et al*., 2005.
MUR	*Pipistrellus pipistrellus*	Vizkaya	Spain	4	Buenetxea, X. y Garaita, R. 2006.
MUR	*Pipistrellus pipistrellus*		France	15	Cosson, 2004. Cosson y Dulac 2005, 2006 y 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus pipistrellus*	Cádiz	Spain	3	Muñoz, 2008e
MUR	*Pipistrellus pipistrellus*	Cádiz	Spain	2	Yarte, 2009
MUR	*Pipistrellus pipistrellus*	Cádiz	Spain	1	Fernández, 2008a
MUR	*Pipistrellus pipistrellus*	Cádiz	Spain	2	Ornitour, 2008d
MUR	*Pipistrellus pipistrellus*	Cádiz	Spain	18	Lazo *et al*., 2008
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2004e
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	1	Faci *et al*., 2005b
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	1	Parra, 2008a.
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	3	Merchén, 2008a
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	3	Anónimo, 2008
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	2	Ruiz, 2008a
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	2	Merchén, 2008b
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	1	Ruiz, 2008c.
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	3	Gutiérrez, 2008a
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	1	Merchen, 2008c
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	1	Gutiérrez, 2008b
MUR	*Pipistrellus pipistrellus*	Guadalajara	Spain	1	Parra, 2008d
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Córoles, 2008.
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	4	Erans y Domínguez, 2007a
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	2	Cañizares, 2003.
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Martínez-Acacio, 2004.
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Martínez-Acacio *et al*., 2003
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Cañizares, 2004.
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Erans *et al*., 2008
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Capilla Folgado *et al*., 2008
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Cañizares, 2008b
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	3	Torralba, 2004
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	2	Cañizares, 2008d
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Cañizares, 2008e
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Lozano, 2006
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	González, 2007
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	2	Vázquez, 2003
MUR	*Pipistrellus pipistrellus*	Albacete	Spain	1	Fernández y Cañizares, 2001
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Pelayo *et al*., 2001
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	1	Pelayo *et al*., 2001a
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	7	Pelayo *et al*., 2002
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2005a
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Faci, 2004
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	1	Sampietro *et al*., 2014
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Pelayo *et al*., 2001b
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Pelayo *et al*., 2001c
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Oper, 2004a
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2005b
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2004b
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2005c
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Oper, 2006a
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	4	Oper, 2004c
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	4	Oper, 2005d
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Oper, 2004d
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Oper, 2005e
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2006b
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	3	Oper, 2004f
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	Oper, 2005f
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	4	Oper, 2004g
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	5	Oper, 2005g
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	1	Martín-Barajas *et al*., 2006
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	5	Oper, 2005h
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	4	Oper, 2006d
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	4	Oper, 2006c

MUR	*Pipistrellus pipistrellus*	Aragón	Spain	2	L'auca, 2006
MUR	*Pipistrellus pipistrellus*	Aragón	Spain	1	Saenz, 2003
MUR	*Pipistrellus pygmaeus*	Schleswig-Holstein	Germany	1	Göttsche y Göbel, 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus savii*	Guadalajara	Spain	1	Gutiérrez, 2008a
MUR	*Pipistrellus sp.*	Rosskopt	Germany	4	Behr y von Helverse, 2006. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus sp.*		Croatia	4	Zagmasjster *et al*. ,2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus sp.*	Aragón	Spain	5	Latorre y Zueco, 1998. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus sp.*		France	17	Cosson, 2004. Cosson y Dulac 2005, 2006 y 2007. En: Rodrigues *et al*. 2008.
MUR	*Pipistrellus sp.*	Aragón	Spain	2	Pelayo *et al*, 1999
MUR	*Pipistrellus sp.*	Aragón	Spain	1	Pelayo *et al*., 2002
MUR	*Pipistrellus sp.*	Aragón	Spain	1	Pelayo *et al*., 2001b
MUR	*Pipistrellus sp.*	Cádiz	Spain	1	Muñoz, 2008b.
MUR	*Pipistrellus sp.*	Cádiz	Spain	2	Muñoz, 2008c.
MUR	*Pipistrellus sp.*	Cádiz	Spain	1	Muñoz, 2008g.
MUR	*Pipistrellus sp.*	Cádiz	Spain	1	Lobón y Villar, 2009g.
MUR	*Pipistrellus sp.*	Aragón	Spain	3	Pelayo *et al*., 2001
MUR	*Pipistrellus sp.*	Aragón	Spain	7	Pelayo *et al*., 2001a
MUR	*Plecotus auritus*	Landkreis Nordhausen	Germany	1	Haase y Rose, 2004. En: Rodrigues *et al*. 2008.
MUR	*Plecotus austriacus*	Lower	Austria	1	Traxler *et al*. , 2004. En: Rodrigues *et al*. 2008
MUR	*Tadarida teniotis*	Aragón	Spain	1	Latorre y Zueco, 1998. En: Rodrigues *et al*. 2008.
MUR	*Tadarida teniotis*	Albacete	Spain	1	Erans y Domínguez, 2007a
MUR	*Tadarida teniotis*	Albacete	Spain	4	Erans *et al*., 2008
MUR	*Tadarida teniotis*	Albacete	Spain	1	Gónzalez y Lozano, 2005
MUR	*Tadarida teniotis*	Albacete	Spain	1	Cañizares y Tortosa, 2003
MUR	*Tadarida teniotis*	Albacete	Spain	1	Cañizares, 2003.
MUR	*Tadarida teniotis*	Albacete	Spain	5	Tortosa, 2004
MUR	*Tadarida teniotis*	Aragón	Spain	1	Pelayo *et al*., 2001a
MUR	*Tadarida teniotis*	Aragón	Spain	1	Pelayo *et al*., 2002
MUR	*Tadarida teniotis*	Aragón	Spain	1	Oper, 2003
MUR	*Tadarida teniotis*	Aragón	Spain	1	Oper, 2004e
MUR	*Tadarida teniotis*	Castilla-La Mancha	Spain	2	Informe anual nº 4 (enero-diciembre 2007). PVA Parque eólico Alhambra
MUR	*Vespertilio murinus*	Thuringia	Germany	2	Kusenbach, 2004. En: Rodrigues *et al*. 2008.
MUR	*Vespertilio murinus*	Freiburg	Germany	1	Brinkmann *et al*., 2006. En: Rodrigues *et al*. 2008.
MUR	*Vespertilio murinus*	Oberlausitz	Germany	6	Trapp *et al*., 2002. En: Rodrigues *et al*. 2008.
INS	*Lucanus cervus*	Soria	Spain	1	Portulano, 2006b.
PAS	*Passer domesticus*	Albacete	Spain	3	Martínez-Acacio, 2005a.
PAS	*Passer domesticus*	Albacete	Spain	1	González, 2006c
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2004a
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2005b
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2004b
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2006a
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2003
PAS	*Passer domesticus*	Aragón	Spain	5	Oper, 2004c
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2006c
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2004f
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2005f
PAS	*Passer domesticus*	Aragón	Spain	1	Oper, 2005g
PAS	*Passer domesticus*	Aragón	Spain	2	Oper, 2005h.

Legend

MAR: marine birds (Gaviidae, Procellariiformes, Pelecaniformes and Sulidae)

ACU: waterbirds and storks (Podicipedidae, Phalacrocoracidae, Ciconiiformes, Phoenicopteriformes and Anseriformes)

RAP: raptors (Falconiformes)

GAL: partridges and pheasants (Galliformes)

GRU: cranes (Gruiformes)

LIM: waders (Charadriiformes except Laridae)

GAV: seagulls (Stercoraridae, Laridae and Rynchopidae)

COL: pigeons (Columbiformes and Pterocliformes)

CUC: cuckoos (Cuculiformes)

NOC: nocturnal birds (Strigiformes y Caprimulgidae)

VEN: swifts (Apodiformes)

PIC: woodpeckers (Piciformes)

PAS: passerines (Passeriformes)

MUR: bats

INS: protected insects

Bold text indicates species with regular presence in Spain.

ANNEX II

Species	Buffer radio[1]	Foraging Area	Nest Site	Bibliography
Peregrine Falcon *(Falco peregrinus)*	2 km		Scotland	Bright, J.A., Langston, R.H.W, Bullman, R., Evans, J.R. (2006) Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland
Peregrine Falcon *(Falco peregrinus)*		2-4 km (min.) 15-25 km (max.)	Zembra Island, Tunisia	Cade, T. J., Enderson, J. H. Thelander, C. G. & White, C. M. (Eds) (1988) *Peregrine Falcon Populations. Their management and recovery. The Peregrine Fund, Inc., boise, Idaho.*
Peregrine Falcon *(Falco peregrinus)*		3 -14 km	River Yukon, Alaska	Hunter, R.E., Crawford, J. A. & Ambrose, R.E. (1988). Prey selection by Peregrine Falcons during the nestling stage. *J. Wildl. Mgmt* 52, 730-736.
Peregrine Falcon *(Falco peregrinus)*		5 km (average)	Inland cliff eyrie in California	Enderson, J. H. & Kirven, M. N.(1983) flights of nesting Pergrine Falcons recorded by telemetry. Raptors Res. 17 – 33- 37.
Peregrine Falcon *(Falco peregrinus)*		15km	Central Europe	Gultz von Blotzheim, U. N., Bauer, K. M. & Bezzel, E. (1971) Hadbuch der Vögel Mitteleuropas. Vol. 4 Ademishe Verlagsgesellshaft, Frankfurt am Main.
Peregrine Falcon *(Falco peregrinus)*	3 km	2 km – 6km (females)	Valley of River Angosto en Lakland, Scotland	Martin, A. P. (1980) A study of a pair of breeding Peregrine Falcons *(Falco peregrinus peregrinus)* during part of the nesting period. Unpublished BSc. dissertation, Dept Zoology, Univ. Durham.
Peregrine Falcon *(Falco peregrinus)*	4 km	2km	Cliffs in Scotland	Weir, D.N. (1977) The Peregrine in N.E. Scotland in relation to food and to pesticide. Pp. 56-8 in *Pilgrinmsfalk*. Report from a Peregrine conference held at Grimsö Wildlife Research Station, Sweden, 1-2 April 1977, ed. Peter Lindberg. Swedish Society for the Conservation of Nature, Stockholm. (1978) Wild Peregrines and Grouse. Falconer 7, 98-102
Montagu's Harrier *(Circus pygargus)*	2 km	2 km (males)	Castellón, Spain	Bort, J. & Surroca, M. (1995) Estudio del comportamiento del aguilucho cenizo *Circus pygargus* durante el período reproductive en la provincia de Castellón. Primeros datos sobre migración. *Alytes*. Vol. VII: 297-316.
	4.5 km	3 +/- 1 up 5 +/- 1 (95% hunting time < 4.5 km)	Western France	Salamolard, M (1997) Utilisation de l'espace par le Busard cendré Circus pygargus. Superficie et distribution des zones de chasse. *Alauda*, vol. 65, nº 4, pp. 307-320 (1p. 3/4)
	5 km	1-2 km females 3 - 8.5 km males (75 % localities at < 2km)	Extremadura	Arroyo, B., Pinilla, A., Mougeot, F., Crystal, F. and Guerrero, A. (2008). Estudio de la ecología poblacional dle aguilucho cenizo (*Circus pygargus*) en Extremadura. Servicio de Conservación de la Naturaleza y Espacios Naturales Protegidos, Junta de Extremadura.
	5 km	5 km (average) (85% attempts < 10km)	Catalunya	Guixé, D. (2004) Some aspects of the breeding and foraging behaviour of the Montagu's harrier Cirucs pygargus in NE Spain. International Symposium on Ecology and Conservation of Steppe-land Birds.
Hen Harrier *(Circus cyaneus)*		1 km nests 2km roosts	Scotland	Bright, J.A., Langston, R.H.W, Bullman, R., Evans, J.R. (2006) Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland
Hen Harrier *(Circus cyaneus)*	3 km	1-2 km (females)	Scotland	Arroyo, B., Leckie, F & Redpath, S. (2006) Habitat use and range management on priority areas for Hen Harriers; Final Report. Centre for Ecology and Hydrology, Hill of Brathens, Banchory, Aderdeenshire, AB31 4BW.
Red kite *(Miluvs milvus)*	15 km	2.1 -14.6 km distance to roost	Doñana, Spain	Heredia, B., Alonso, J. C., Hiraldo, F. (1991) Space and habitat use by Red Kite *Milvus milvus* during winter in the Guadalquivir marshes: a comparison between resident and wintering populations, Ibis Vol. 133 Issue 4 Page: 374-381
Red kite *(Miluvs milvus)*	3 km nests 5 km roosts		Scotland	Bright, J.A., Langston, R.H.W, Bullman, R., Evans, J.R. (2006) Bird Sensitivity Map to provide locational guidance for onshore wind farms in Scotland
Red kite *(Miluvs milvus)*		> 20 km from nest	Spain	Veiga, J. P. and F. Hiraldo (1990) Food habits and the survival and growth of nestlings in two sympatric kites (*Milvus milvus and Milvus migrans*). Holarctic Ecology 13: 92-71.
Red kite *(Miluvs milvus)*	3.9 km resident roosts		Doñana, Spain	Heredia, B., Alonso, J. C. and F. Hiraldo (1991) Space and habitat use by Red Kites *Milvus milvus* during winter in the Guadalquivir marshes: a comparison between resident and wintering populations. Ibis 133: 374-381.
Red kite *(Miluvs milvus)*		> 10 km	Germany	Ortlieb, R. (1989) Der Rotmilan *Milvus milvus*. Die Neue Brehm-Bücherei 532, Wittenburg.
Black kite *(Milvus migrans)*	1 km	1 km	Lugano Lake, Italy	Sergio, F. Pedrini, P., Marchesi, L. (2002) Biological Conservation
Cinereous vulture *(Aegypius monachus)*	50 km	26.3 km (average) 342 km (max.) 7.9 km (min.)	Umbría de Alcudia, Ciudad Real, Spain	Moreno-Opo, R.; Arredondo, Á. and F. Guil (2010). Área de campeo y alimentación del buitre negro Aegypius monachus según recursos ganaderos en el centro de España. *Ardeola*. P. 111-119.

Cinereous vulture *(Aegypius monachus)*	50 km	27.86 km (average) 86 km (max)	Sierra Pelada, Huelva, Spain	Carrete, M. Donázar, J. A. (2005) Application of central-place foraging theory shows the importance of Mediterranean dehesas for the conservation of the cinereous vulture, Aegypius monachus. *Biological Conservation 126 582-590.*
Cinereous vulture *(Aegypius monachus)*	50 km	16 - 28km (breeding season) max. 80 km	Extremadura	Corbacho, C. Costillo, E. Lagoa, G & Moran, R. (2001) Effect of breeding cycle on foraging areas and home range of Black Vulture Aegypius monachus in Extremadura. Resúmenes del 4ª Eurasian congress on raptors. Estación Biológica de Doñana-Raptor Research Foundation. Seville.
Cinereous vulture *(Aegypius monachus)*	50 km	14.10 km (average) max 43.36 km – 76.84 km	Sierra de San Pedro, Spain	Costillo, E. 2005. Biología y Conservación de las poblaciones de Buitre Negro Aegypius monachus en Extremadura. Tesis Doctoral. Universidad de Extremadura.
Griffon vulture *(Gyps fulvus)*	25 km	25km from the colony	Extremadura	König, C. (1974). Zum verhalten spanischer Geier an Kadavern. J. Orn. 115:289-320.
Griffon vulture *(Gyps fulvus)*	50 km	50-70 km	Pyrenees, Spain	Donázar, J. A. (1993) Los buitres ibéricos: Biología y Conservación. J.M. Reyero, D. L. Eds. Madrid.
Egyptian Vulture *(Neophron percnopterus)*	10 km	80 km	Southern Navarre	Donázar, J.C.and O. Ceballos (1987) Uso del espacio y tasas reproductoras en el alimoche (Neophron percnopterus). Informe inédito, ICONA. Madrid.
		Max. 14 km 4-5 km (average)	Bulgaria	Baumargt, W. (1971) Ubre die geier bulgariens. Der shcmutzgeier. Beitr. Vogeldkde 17:33 – 70.
		5 km	Southern Navarre	Ceballos. O. and J. A. Donázar. 1988. Actividad, uso del espacio y cuidado parental en una pareja de alimoches (Neophron percnopterus) durante el periodo de dependencia de los pollos. Ecología 2:275-291.
		15 km		R.D. 439/1990. Catálogo Nacional de Especies Amenazadas. Ficha técnica Neophron percnopterus (Linnaeus, 1758).
Osprey *(Pandion heliaetus)*	2 km	2 km	England	Bright, J.A., Langston, R.H.W, Anthony, S. (2009) Locational guidance for onshore wind farms in relation to birds of conservation priority in England
Imperial Eagle *(Aquila adalberti)*	10 km	30 km (in breeding season) 61 km (in non-breedng season)	Madrid, Ávila and Toledo	González, L.M.; Margalida, A. (Editors). 2008. Biología del águila imperial ibérica (*Aquila adalberti*). Conservation biology of the Spanish imperial eagle (*Aquila adalberti*). Organismo Autónomo Parques Nacionales. Ministerio de Medio Ambiente y Medio Marino y Rural. Madrid. Pp. 211.
Bonelli's eagle *(Hieraaetus fasciatus)*	10 km	18 km	Spain	Parrellada, X. 2001. L'Aguila cuabarrada. Un símbol dels ecosistemes mediterranis en perril. *Bioma*, 4:32-35.
Golden eagle *(Aquila chrysaestos)*	5 km	> 9 km < 6 km 98% sightings	West Scotland	McGrady, M.J., Grant, J. R., Baingridge, I. P. and David R.A. McLeodD.R.A.2002. *A model of golden eagle* (Aquila chrysaetos) *ranging behavior*. J. Raptor Res. 36 (1 Supplement): 62-69.
Little Bustard *(Tetrax tetrax)*	8 km	8 km	Iberian Peninsula	García de la Morena. E. L.; Bota, G.; Silva, J. P.; Pojoan, A.; De Juana, E.; Suárez, F.; Mañosa, S. and Morales, M. B. Patrones de movimiento estacional del sisón común (*Tetrax tetrax*) en la península ibérica. VI Congreso de Ornitología y IV Congreso Ibérico de Ornitología. Elvas, 5-8 December 2009. com. oral.
Stone Curlew *(Burhinus oedicnemus)*	1 km	1 km	England	Bright, J.A., Langston, R.H.W, Anthony, S. (2009) Locational guidance for onshore wind farms in relation to birds of conservation priority in England
Lesser kestrel[2] *(Falco naumanni)*	1 km	Min. 30 m Max. 2060 m	Castilla-La Mancha	Bonal Andrés, R. & Aparicio Munera, J.M. 2001. Estudio de la utilización del hábitat por parte del Cernícalo primilla (Falco naumanni) en una colonia de la comarca de La Mancha. Biología y Conservación del Cernícalo Primilla. Consejería de Medio Ambiente. Comunidad de Madrid.
Lesser kestrel *(Falco naumanni)*			Sevilla[3]	Negro, J. J., Bustamante, J. Melguizo, C. and Ruiz, J. L. 2001. Actividad nocturna del cernícalo primilla (*Falco naumanni*) en la ciudad de Sevilla. Biología y Conservación del Cernícalo Primilla. Consejería de Medio Ambiente. Comunidad de Madrid.
Common crane *(Grus grus)*	10 km	25 km	Gallocanta	Alonso, J.C.: Bautista, L. M. and Alonso, J. A. Family-based territoriality vs flocking in wintering common cranes Grus grus. *Journal of Avian Biology* 35:434-444, 2004. Bautista, L. M.; Alonso, J.C. and Alonso, J.A. A field test of ideal free distribution in flock-feeding common cranes. *Journal of Animal Ecology*, 64, 747-757. 1995.
Bittern *(Botaurus stellaris)*	2 km	Females > 2km		Gilbert, G., Tyler, G.A., Dunn, C.J. and Smith, K.W. 2005. Nesting habitat selection by bitterns *Botaurus stellaris* in Britain and the implications for wetland management. Biological Conservation 124: 547-553

1 These distances should be adjusted to suit the species in question and its population trend in the proposed wind-farm region as well as an analysis of food resources in the hunting or foraging area.

2 These values are indicative and not necessarily applicable elsewhere. Conditional factors such as the quality of the habitat or the size of the colony may influence the size of a colony's feeding area.

3 Note that an unusual nocturnal activity has been detected in this species. This has occurred in built-up areas and as yet we do not know if the species is equally nocturnal in more open habitat. If so, this characteristic should be taken into account at EIA design project level.

ANNEX III

Information Quality Assessment

This annex sets out how to assess the quality of the minimum information needed for a wind-farm assessment.

Necessary Information	Adequate? YES/NO	Information to hand[1]	Suitability of information[2]
Inventory			
Bird species list			
Distribution and abundance of breeding birds[3]			
Abundance and seasonal behaviour patterns of birds of passage			
Distribution and abundance of wintering birds[4]			
Bird colonies or roosts (species, size, location)			
Flocks of migratory birds in rest areas			
Raptor flocks			
Wader flocks			
Distribution and abundance of birds with display flights			
List of bat species			
Distribution and abundance of breeding bats			
Abundance and seasonal patterns of bats on passage			
Bat colonies and refuges (species, size, location)			
Use of Space			
Habitat selection of species to be considered[5]			
Use of airspace around the wind turbines[6]			
Nocturnal use of airspace around the wind turbines[7]			
Flight corridors of migratory birds			
Habitat			
State of conservation of the habitat[8]			
Relation between the species and the habitat (abundance and distribution of each one)			
Amount of each habitat that will be lost or altered			
Roosts			
Detailed vegetation maps			
Special topographical features			
SPAs			
SCIs			
IBAs			
IMAs			

Necessary Information	Adequate? YES/NO	Information to hand[1]	Suitability of information[2]
Meteorological Data			
Wind direction and speed			
Number of days with poor visibility			
Human Use			
Amount and type of human presence at different times of year			
Sundries			
State of conservation of the species present			
State of protection of the species present			
List of species prone to wind-turbine collisions			
List of species prone to power line collisions			
Bird attracting factors[9]			

1. *This column should detail the culled information.*
2. *This column should give grounds for suitability of the culled information for impact assessment.*
3. *Barring environmental impact studies of wind farms with very few wind turbines and sited in areas of little ornithological value, counts should be made to estimate the abundance or relative abundance of breeding birds in the area. The scope of these counts will vary directly with the size of the area affected, the size of the proposed wind farm itself and the complexity of the habitat in the census zone (for example, bird counts are much more difficult in wooded areas than in farming areas).*
4. *These counts should be conducted by searching the study zone, for example using standardised transects through the key habitats. Their frequency will depend on the local birdlife. They should include such factors as the birds' use of the habitat and bird-attracting factors such as food sources and also the probability of these factors varying from one year to another. These counts should be conducted in a standard way to ensure repeatability and thus be able to ascertain any change in the birds' use of the site after the wind turbines have been installed.*
5. *The species of birds and bats to be considered will be those listed as Vulnerable, Sensitive to Habitat Changes and In Danger in the* Catálogo Nacional de Especies Amenazadas *(National Catalogue of Threatened Species) and in the* Catálogo Regional de Especies Amenazadas *(Regional Catalogue of Threatened Species), plus the Annex I bird species of the Birds Directive the Annex II and IV bats of the Habitats Directive and the bird and bat species listed as In Danger, and In Critical Danger in the* Libros Rojos*.*
6. *Flying height, direction, bird abundance and 1:25.000-scale trajectory maps of the wind farm implementation site.*
7. *By means of mobile radars or thermal cameras.*
8. *An assessment should be made of whether the zone directly affected by construction of the projected wind farm includes habitat of potential value for birds and, if so, the type of habitat affected. To do so a map should be drawn up of the natural habitats likely to be affected.*
9. *An assessment should be made of whether or not there are any bird-attracting factors in the projected wind farm area, especially illuminated structures during periods of nocturnal migration.*

ANNEX IV

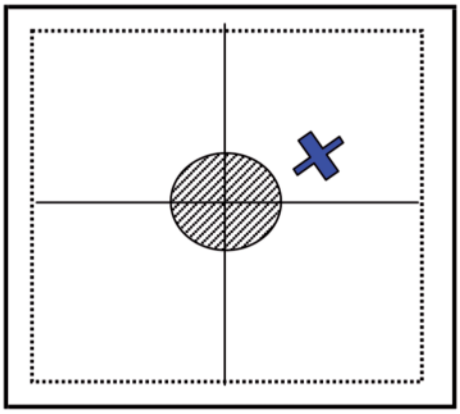
SEO/BirdLife

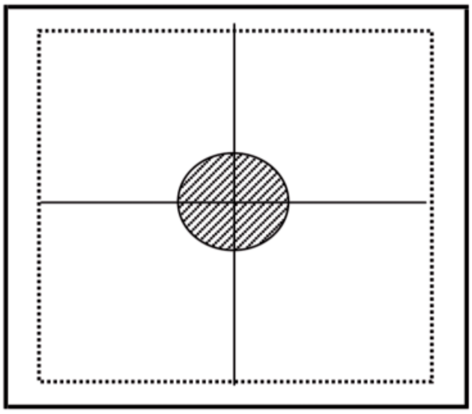
FIELD RECORDING SHEET 1. DIRECT MORTALIY

Project	PE Los Escarpes
Municipal district	Ossa de Montiel
Searcher	Jaime Fuentes
Contact	679 463 000

Nº of wind turbines	18
Km. of power line	6
Wind turbine model	Enercon E-48
Tower model	C-1000 12E

DATE	16/6/10	
SPECIES	Cernícalo vulgar	
UTM Y	654879	
UTM X	4425879	
INFRASTRUCTURE	~~Wind turbine~~	Wind turbine
	Meteorological mast	Meteorological mast
	Power line pylon	Power line pylon
	Power line cables	Power line cables
	Others (indicate)	Others (indicate)
Infrastructure code	A04	
DISTANCE (m)	4 m	
AGE	Juvenile	Juvenile
	Immature	Immature
	~~Adult~~	Adult
	Indeterminate	Indeterminate
SEX	~~Male~~	Male
	Female	Female
	Immature	Immature
	Indeterminate	Indeterminate
CARCASS STATE	Fresh	Fresh
	Depredated	Depredated
	~~Decomposed~~	Decomposed
	Remains	Remains
TIME OF DEATH	12 hours	12 hours
	24 hours	24 hours
	2 days	2 days
	3 days	3 days
	4 days	4 days
	5 days	5 days
	6 days	6 days
	~~7 days~~	7 days
	Other (indicate)	Other (indicate)
FIND	Within a search	Within a search
	Outside a search	Outside a search
PHOTOGRAPHS	2 fotografías	
HABITAT CODE	A-14-01-02	
OBSERVATIONS	Parcialmente depredado Tormentas recientes	





IIndicate the carcass´s position in relation to the wind turbine. The upper part shows geographical north

FIELD RECORDING SHEET 2. LINE TRANSECTS

SEO/BirdLife

Project	PE EL HOYO		Municipality	SAN AGUSTÍN		Observer's	PEDRO RAMÍREZ		Contact	666 777 555	
Date	16/6/10	Start time	07:30	End time	11:00	Cloud cover	2	wind	2	Rain	NO

UTM X start	567432	UTM X end	558901		UTM X start		UTM X end			UTM X start		UTM X end		
UTM Y start	4342178	UTM Y end	4311245		UTM Y start		UTM Y end			UTM Y start		UTM Y end		
Species		<25 m	>25 m		Species		<25 m	>25 m		Species		<25 m	>25 m	
Herrerillo común		1,1,1	1											
Pizón vulgar		2,3,1,1,1	1,1,1											
Carbonero común		1,1	1											
Abubilla			1											
Cogujada común		2,3,4	1,2											
Arrendajo		1	1,1											

FIELD RECORDING SHEET 3. LINE TRANSECTS

SEO/BirdLife

Project	PE EL HOYO		Municipality	SAN AGUSTÍN		Observer's	PEDRO RAMÍREZ		Contact	666 777 555	
Date	16/6/10	Start time	07:30	End time	11:00	Cloud cover	2	wind	2	Rain	NO

UTM X start	567432	UTM X end	558901	UTM X start		UTM X end		UTM X start		UTM X end	
UTM Y start	4342178	UTM Y end	4311245	UTM Y start		UTM Y end		UTM Y start		UTM Y end	
Species		<25 m	>25 m	Species		<25 m	>25 m	Species		<25 m	>25 m
Herrerillo común		1,1,1	1								
Pizón vulgar		2,3,1,1,1	1,1,1								
Carbonero común		1,1	1								
Abubilla			1								
Cogujada común		2,3,4	1,2								
Arrendajo		1	1,1								

FIELD RECORDING SHEET 4. POINT COUNTS

SEO/BirdLife

Project	PE LA BUITRERA		Municipality	VALDEGANGA		Observer´s name	ANTONIO ARNEDO		Contact	antonioarne@hotmail.com	
Date	5/2/10	Start time	08:00	End time	13:00	Cloud cover	4	wind	1	Rain	NO

UTM X	567432	UTM Y	4536711	UTM X		UTM Y		UTM X		UTM Y	
Species		<25m	>25m	Species		<25m	>25m	Species		<25m	>25m
Reyezuelo listado		1	1								
Pizón vulgar		1,1,1	2,2,1								
Escribano soteño		2	1								
Alondra totovía		2,2									
Pico picapinos			1	‖							
Arrendajo		1	1,1								
Urraca		1,1	2								
Paloma torcaz		2	2,6,10								

FIELD RECORDING SHEET 5. CONTACT RECORDS AND DETERMINATION OF USE AREAS

SEO/BirdLife

N° of lookout point	1	UTM X	657896	Cloud cover	30%	Start time	08:30	Habitat Code
Date	16/6/10	UTM Y	4338795	Wind speed	2	End time	13:00	A-14-01-02
Municipality	La Roda	Use	30S					

Minutes	Code	Species	Height (m)	Flying direction	Geographical feature	UTM X*	UTM Y*	Observations
10'	1	Busardo ratonero	30	SE	Ladera	655487	4455879	Adulto
	2	Aguililla calzada	45	NO	Collado	685472	4358798	Juvenil
	3	Aguilucho cenizo	40	N	Fondo de Valle	658792	4456231	Anilla D34
20'								
30'								
40'								
50'								
60'								
70'								

* Contact UTMs are obtained from topographic mapping of the sighting

Energy production, including from renewable sources, is rife with potentially dangerous consequences for wildlife and nature conservation. The right risk-benefit balance therefore needs to be struck, minimising any adverse environmental effect. Collisions and disturbance caused by wind turbines, barriers to the bird's movements and habitat loss are the main negative effects of wind farms on birds. A sine qua non of avoiding or reducing these effects is to carry out the best possible and most apposite environmental assessment, following best-practice guidelines.

SEO/BirdLife, representative in Spain of BirdLife International, is a scientific and conservationist association founded in 1954, studying birds and nature and working for their conservation. As such it is the doyen of nature conservation NGOs in Spain, now boasting over 55 years of unbroken activity.

One of SEO/BirdLife's hallmark traits is an ongoing and unflinching effort to encourage an awareness of birds and their habitats and a respect for same among the Spanish population. Only in this way will society really appreciate the importance of conserving our birdlife and the habitats it lives in.

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Translation Subsidised by:

MAVA FONDATION POUR LA NATURE
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